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LEVEL II

AMCP 750-16

MAINTENANCE OF SUPPLIES AND EQUIPMENT

AMC GUIDE TO LOGISTICS SUPPORT ANALYSIS

This copy is a reprint which includes current pages from DARCOM Change 1 dated 10 January 1978.

HEADQUARTERS, ARMY MATERIEL COMMAND

DEPARTMENT OF THE ARMY
HEADQUARTERS US ARMY MATERIEL DEVELOPMENT AND READINESS COMMAND
5001 Eisenhower Ave, Alexandria, VA 22333

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10 January 1978

Maintenance of
Supplies and Equipment

AMC GUIDE
TO
LOGISTIC SUPPORT ANALYSIS

AMCP 750-16, 30 June 1975, is changed as indicated below:

a. Remove pages and insert new pages as indicated below:

Remove pages--	Insert pages--
i through vi	i through viii
1-1 and 1-2	1-1 and 1-2
2-1 through 2-5	2-1 through 2-5
3-1 through 3-6	3-1 through 3-6
4-3 and 4-4	4-3 and 4-4
A-1 through A-14	A-1 through A-6
B-1 through B-136	B-1 through B-169
None	C-1 through C-42

b. On all revised pages, changed portions of the text are indicated by vertical lines in the left margins.

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Maintenance of Supplies and Equipment

AMC GUIDE TO LOGISTIC SUPPORT ANALYSIS

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LIST OF ILLUSTRATIONS

LIST OF ABBREVIATIONS AND ACRONYMS

	A
ADP	Automatic Data Processing
ALPHA	AMC Logistic Program Hardcore Automated
AMC	Army Materiel Command
AMETA	Army Management Engineering Training Agency
ARMCOM	Armament Command
ASARC	Army Systems Acquisition Review Council
	C
CDRL	Contract Data Requirements List (DD Form 1423)
CEI	Component End Item
CFM	Contractor Furnished Materiel
CFP	Concept Formulation Package
CI	Configuration Item
COAMP	Cost Analysis of Maintenance Policies
COBOL	Common Business Oriented Language
CTP	Coordinated Test Program
	D
DARCOM	US Army Materiel Development and Readiness Command
DED	Data Element Definition
DID	Data Item Description (DD Form 1664)
DP	Development Plan
DSARC	Defense Systems Acquisition Review Council
DT	Development Test
	E
ECOM	Electronics Command
ECP	Engineering Change Proposal
	F
FFBD	Functional Flow Block Diagram
FGC	Functional Group Code
	G
GEMM	Generalized Electronic Maintenance Model
GFE	Government Furnished Equipment
GFM	Government Furnished Materiel
GFP	Government Furnished Property
GIDEP	Government-Industry Data Exchange Program

LIST OF ABBREVIATIONS AND ACRONYMS--Continued

	I
ILS	Integrated Logistic Support
IOC	Initial Operational Capability
	J
JCL	Job Control Language
	L
LSA	Logistic Support Analysis
LSAR	Logistic Support Analysis Record
	M
M	Maintainability
MAC	Maintenance Allocation Chart
MCA	Military Construction, Army
MTSP	Maintenance Test Support Package
	N
NMP	National Maintenance Point
	O
OMA	Operational and Maintenance, Army
OT	Operational Test
OTEA	Operational Test and Evaluation Agency
	P
PCA	Physical Configuration Audit
PEMA	Procurement of Missiles and Equipment, Army
PMAC	Preliminary Maintenance Allocation Chart
PTD	Provisioning Technical Documentation
	Q
QQPRI	Qualitative and Quantitative Personnel Requirements Information
	R
R	Reliability
RAM	Reliability, Availability, Maintainability
RCM	Reliability Centered Maintenance
RDTE	Research, Development, Test and Evaluation
RPSTL	Repair Parts and Special Tool List
RURLAM	Replacement Unit Repair Level Analysis Model

LIST OF ABBREVIATIONS AND ACRONYMS--Continued

S

STD	Standard

T

TAMMS	The Army Maintenance Management System
TDA	Table of Distribution and Allowances
TMDE	Test, Measurement and Diagnostic Equipment
TOA	Table of Allowances
TOE	Table of Organization and Equipment

W

WBS	Work Breakdown Structure
WUC	Work Unit Code

ABSTRACT

PREFACE

This pamphlet defines the analytical steps collectively called logistic support analysis (LSA). LSA is usually associated with activity surrounding the development of a major new weapons system. The objectives and procedures described in this pamphlet are not confined to this narrow limit; they are equally valid for other types of materiel as well as non-major procurements such as off-the-shelf or modified commercial items.

Throughout this pamphlet analysis activities are related to the conventional life-cycle timing of events. It should be recognized that many major programs do not follow this conventional model. The trend toward expanding validation phase effort is well established and results in earlier definition of system configuration. It is essential on these programs, as on all programs, for LSA activities to be paced by the design status. Therefore, many of the LSA actions normally assigned to the full-scale development phase actually must be performed in the validation phase. If these actions are not taken during validation there will be little opportunity for their successful completion during a foreshortened full-scale development phase.

Change 1 to AMCP 750-16 incorporates major changes to the LSA Record (LSAR). The LSAR has been revised to incorporate the latest DOD provisioning requirements (MIL-STD-1552 and MIL-STD-1561). LSAR ADP programs have been modified to accept these new provisioning data elements and have also been revised to produce additional output reports and operate more efficiently.

ABSTRACT

CHAPTER 1

INTRODUCTION

1-1. Purpose. a. This pamphlet is guidance for establishing and implementing a logistic support analysis (LSA) program. The LSA program described is DARCOM implementation of MIL-STD-1388-1 and MIL-STD-1388-2, Logistic Support Analysis. LSA/LSAR programs applied in accordance with this document satisfy the LSA/LSAR requirements of DARCOM-R 700-97, Standard Integrated Support Management System (SISMS). The purpose of this pamphlet is to:

(1) State LSA goals and objectives.

(2) List planning requirements for the LSA program and integrated logistic support testing.

(3) Provide sample work statements and data requirements for contractor LSA programs.

(4) Provide formats and instructions for a Logistic Support Analysis Record (LSAR).

(5) Provide guidelines for the application of reliability centered maintenance (RCM) as part of the LSA process.

b. Logistic support is a principal design parameter. The purpose of the LSA is to evaluate system design and operational characteristics to make objective logistic support decisions. LSA actions identify, define, analyze, quantify, and process integrated logistic support (ILS) requirements. LSA is an integral part of the system engineering effort to establish design parameters. LSA data are the bases for design versus support trade-offs which benefit the entire program. The objective of LSA is to achieve balance between system readiness, operational capability and cost, and the system's logistic requirements.

1-2. Scope. a. LSA will be used by all DARCOM subordinate commands and activities to determine logistic support requirements. The LSA program described in chapter 2 is equally applicable to contractor or Government in-house programs for major or non-major acquisitions. Tests to verify, demonstrate, and evaluate analysis predictions are part of the LSA process. The program of testing described in chapter 3 provides progressive assurance that contractual ILS requirements are being achieved. Basic analytical techniques and analysis aids are identified in Chapter 4.

b. Paragraph 2-17d of AR 750-1, Army Materiel Maintenance Concepts and Policies, requires that contracts provide for an MEA and operation of a maintenance engineering analysis data system (MEADS). The terms LSA and LSAR supersede the terms Maintenance Engineering Analysis (MEA) and MEA Data System (MEADS). The sample contract work statements in appendix A define a comprehensive LSA program. The LSAR described in appendix B replaces MEADS (TM 38-703-3) as the LSA data system on new DARCOM procurements.

1-3. The LSA Process. a. The LSA program is initiated in the conceptual phase and the scale of effort increases through the development phase. The initial analysis considers those logistic problems that have significant impact on system readiness, capability, or cost. Documentation is kept to the minimum and detailed support planning deferred until detailed hardware design data are available. LSA data are used to influence the design for logistic considerations by challenging characteristics which impose support requirements. Constraints or logistic risks are identified and methods of overcoming or minimizing them developed. Because they have the potential for major impact on design, system support, and cost, these analyses must be made early in order for their results to be accepted.

b. During full-scale development, the LSA analysis process translates hardware design into detailed logistic support requirements for testing, deployment, and operational use. The analysis program unifies the individual logistic support elements into a support system and provides the interface between design engineering and the ILS program.

c. The data base established during development and testing is used during the operational phase to evaluate the equipment's performance after fielding. The impact of equipment modifications on support characteristics are evaluated against the original data base. The LSA data will prove invaluable for establishing design goals and parameters in requirements documents of succeeding generations of materiel. Appropriate levels of analysis effort during life-cycle phases and ILS interfaces are discussed in TM 38-710, Integrated Logistic Support Implementation Guide for DOD Systems and Equipment.

1-4. LSAR Assistance. a. The LSAR described in the May 1972 draft of TM 38-703-3 and June 1975 edition of AMCP 750-16 is functional on several DARCOM development programs. The LSAR contained in appendix B is a major revision of the preceding data systems. Earlier versions of LSAR ADP programs will not produce the output reports described in appendix B and will not process the LSAR "H" data sheet illustrated.

b. LSAR ADP programs and functional documentation are available from the US Army Maintenance Management Center. Questions concerning the installation of computer programs on Government and contractor computers or the utilization of programs and data sheets may be directed to the Center at the address below.

1-5. Changes. Readers of this pamphlet are encouraged to recommend changes to improve its contents. Recommendations should be forwarded to the Commander, US Army Maintenance Management Center, ATTN: DRXMD-MS, Lexington, KY 40511.

CHAPTER 2

LOGISTIC SUPPORT ANALYSIS PROGRAM

2-1. Program Management. a. The LSA program integrates the individual programs for developing logistic support elements and provides the interface between the hardware design and ILS programs. Information exchange between the design and ILS functional organizations is essential to achieve a balance among system readiness, operational capability, cost, and the system's logistic requirements.

b. The keys to good program management are (1) planning which identifies the required actions, and (2) timely management decisions. Program planning must identify WHAT actions are needed, WHO is to take the actions, and WHEN the actions should occur. Timely decision making requires information and the identification of responsibilities and authority.

2-2. Program Objectives. The LSA program has four primary objectives; identification, logistic influence, communications, and verification.

a. The analysis identifies the qualitative and quantitative logistic support requirements. A systematic, comprehensive analysis is conducted on an iterative basis throughout the life cycle. Initial analyses evaluate the system/equipment's design and operational parameters and translate them into a maintenance concept and estimated support costs. During the development phase, maintenance tasks are defined and the logistic support requirements are identified. During the operational phase, proposed design changes and modifications are evaluated to identify their effect on maintenance and support.

b. The analysis influences the system/equipment design for logistic considerations. The initial analysis effort evaluates the effects of design alternatives on support costs and operational readiness. Known scarcities, constraints, or logistic risks are identified and ways of overcoming or minimizing them developed. During full-scale development, the analysis is oriented toward assisting the designer in improving supportability and ease of maintenance.

c. The analysis communicates requirements and integrates the elements of logistic support into a logistic support system. The LSA program establishes a communications link between the hardware design and ILS functional organizations through the LSAR. The LSAR is a source of validated design-related logistic data. The inputs to the LSA process are mission, performance, and environmental requirements; maintenance, supply, and personnel policies; economic criteria; training capabilities; existing skill capabilities; available Government-furnished materiel/equipment; and, maintenance concepts. The LSAR communicates the logistic support requirements and is a source of data for the system/equipment design effort in the form of suggestions for improving the reliability, maintainability,

supportability, and ease of maintenance. The LSAR provides data for risk analyses, effectiveness studies, design/logistic support trade-offs, and life-cycle cost analyses.

d. Testing verifies the supportability of the system/equipment and validates achievement of logistic goals. Progressive ILS testing is part of the overall development and operational testing. This ILS testing verifies supportability features such as accessibility and support system compatibility, and validates the adequacy of the publications, facilities, support equipment, repair parts, and personnel skills. Deficiencies are identified by comparing the test results with the LSAR data.

2-3. Program Planning. a. Requirements for contractor program planning, control, and implementation of the LSA program will be contained in work statements and data item descriptions included in the solicitation document. The bidder's response must specify, in sufficient detail to convey his understanding of the requirements and ability to execute them, the methods he will employ in implementing and controlling the LSA program. (App A)

b. Government in-house planning for the LSA program are contained in Section VI of the Outline Development Plan (ODP) and the Development Plan (DP), AR 70-27. Requirements for and the contents of Section VI (the Plan for Logistic Support) are described in AR 700-127, Integrated Logistic Support, and the DARCOM supplement to AR 700-127.

2-4. Analysis Tasks. a. The LSA process requires many discrete actions be taken from program initiation through fielding. The actions are interrelated and are repeated (iterated) in increasing detail as equipment design progresses. These actions, or sub-analyses, are called analysis tasks and are defined in MIL-STD-1388-1.

b. Government planning and requirements documents and contractor-prepared LSA plans will define the level of effort and the tasks to be applied during the LSA program. These tasks are the basis for integrating the support elements and provide the interface between the design engineering and LSA programs.

c. The iterative nature of the LSA process is graphically illustrated by Figure 2 of MIL-STD-1388-1. Successive iterations of the analysis vary with the need for information and the extent of system/equipment definition. Early trade-off studies are conducted to a level sufficient to provide operational effectiveness and cost data for the alternatives being studied. When decisions are required on such design features as modularization, built-in test equipment, or part discard level, the analysis is conducted to the depth required to substantiate the cost effectiveness of the approach. When the Plan for Logistic Support (Section VI of the Development Plan) is being updated by the Government prior to DT/OT II, the logistic support requirements of the system must be completely identified.

d. The emphasis shifts from one analysis task to another as design progresses and data requirements increase. For example, in the early development stages, when design requirements are merely performance specifications, the analysis is directed toward identifying and establishing design parameters for support functions. After hardware configurations are defined, the analysis effort is directed toward optimizing replacement modules. Well before deployment, the analysis concentrates on the impact on the Army's supply system and maintenance organizations caused by the new materiel.

2-5. Logistic Support Analysis Record (LSAR). a. The LSAR is a medium for systematically recording analysis data. The LSAR may be used on any program, regardless of size or complexity, and whether in-house or contractor developed. The formats and data element definitions in appendix B may be amended, supplemented, or altered with procuring activity approval to tailor them to program variations. The procuring activity must specify which data elements are required for the particular application. (app A)

b. Automatic data processing (ADP) requirements will be specified in the contract work statements. When ADP is used, a series of standard output summaries may be produced as needed by the LSAR computer programs. These standard output summaries are described in appendix B and provide visibility for evaluation and verification of data, program review, planning, or further analysis. The LSAR summaries will be contractually deliverable when they are so prescribed by DD Form 1423, Contract Data Requirements List (CDRL).

c. LSA data generated during the development program are used to produce data requirements listed on the CDRL. The objectives in using LSA data to satisfy CDRL requirements are:

(1) To assure that logistic support (parts, tools, test equipment, personnel, facilities, etc.) requirements are compatible with documents that provide maintenance instructions, skill requirements, and maintenance allocations.

(2) To reduce data acquisition cost by:

(a) Eliminating separate analysis programs which provide the same technical data.

(b) Reducing the number of data systems maintained by the contractor.

(c) Avoiding the delivery of duplicate or redundant data.

(d) Reducing the process of producing CDRL data to an ADP extraction whose only additional cost is machine printout time (if ADP is used).

d. The data acquisition cost is not automatically reduced by specifying use of the LSAR for producing data requirements. The CDRL must be reviewed to ensure that the data call does not include requirements that are LSAR outputs. The following Data Item Descriptions (DID's) should be scrutinized to identify their relationship to LSAR data.

(1) Qualitative and Quantitative Personnel Requirements Information (QQPRI).

(2) Maintenance Allocation Chart (MAC) and Preliminary Maintenance Allocation Chart (PMAC).

(3) Repair Parts and Special Tool List (RPSTL).

(4) Technical publications information.

(5) Provisioning technical documentation.

(6) Facilities design criteria.

(7) Reliability and maintainability reports.

(8) Failure mode and effects summaries.

Bidder responses should be reviewed to assure that their proposals recognize this relationship.

2-6. Data Review and Approval. a. Review and approval of LSA data is accomplished by a Government ILS management team, LSAR review team, or other designated Government personnel. Details regarding this function should be established to fit the program and entered in the contractual agreements. For PM items, the PM representative is leader of the team.

b. The team provides a source of logistic expertise to monitor the contractor LSA program during the life of the contract. The team should include representation from functional organizations involved in the providing GFE/GFM support. Project managed items should include commodity command representation on the team to ensure the smooth transition to NMP support of the item after fielding. The continuity of team membership should be maintained to maximize its effectiveness.

c. The team will review contractor analysis data and recommend its approval or disapproval. The procedures for presenting recommendations to the contractor will be fully described in Government planning documents. Changes to approved design baseline documentation or the maintenance plan which result from data review can only be made with the concurrence of responsible officials.

d. Review team activities and recommendations must be handled with great care during development contracts which have multiple competing contractors; e.g., validation phase contracts. Information must be protected in accordance with competitive-sensitive regulations. Normally the PM issues the policies for his program. Due to the sensitive nature of the competitive situation the team's activities should be coordinated with the contracting officer. The following procedures may be followed:

(1) Team evaluations of analysis data may be recorded for use in the source selection process and for incorporation in the system specification for full-scale development.

(2) Team evaluations of contractor decisions (e.g., on maintenance levels, skill specialty codes, and supply support selections) for validation phase tests (DT/OT I), may be presented to the contractor (through the contracting officer), without violating the competitive atmosphere. The contractor may accept or reject the team's recommendations.

2-7. Non-major Acquisitions. a. The same basic principles and goals apply equally to major and non-major acquisitions. A non-major acquisition program may be minor modification of an existing item, purchase of an off-the-shelf commercial item, or a program in which production is only preceded by a development phase. Major modifications to an existing item are, in general, subject to the same controls and requirements as a major development program.

b. Regardless of the size of the acquisition, an LSA program is required to assure that the program objectives stated in paragraph 2-2 are accomplished. There is little opportunity for the LSA program to exert a logistic influence on the design of off-the-shelf commercial items; but LSA can however, influence selection of the commercial item. Three objectives of identification, communications and verification can be attained. The principal difference between the LSA programs on major and non-major acquisitions is a matter of timing and depth and not how it is conducted.

c. A non-major program may use the LSAR in a manual application; however, if a suitable computer is available, the cost of computerizing the LSAR could be less in the long run. In the case of commercial design items, a great deal of operational and test data should be available from the manufacturer for entry in the LSAR.

d. In most pamphlet contexts, substituting the word "procurement" for "development" is sufficient clarification for the guidance to apply to commercial or modified commercial items. It should be realized that the main objective of the LSA application to a commercial item will be to identify the logistic resources required. The most significant difference between the LSA application on a developmental item versus off-the-shelf equipment is that on the former, it is an iterative process effecting design as well as the logistic resources required.

CHAPTER 3

TESTING

3-1. Purpose. a. This chapter defines the relationship between system/equipment testing and logistic support testing, and explains the role of the LSA in testing. It describes how data from the LSAR are used in testing, and how test data are used to update the LSAR. There is no attempt to provide a complete description of the overall test program, or even the logistic support related portions of the program.

b. Logistic support testing is an extension of the LSA process and is a verification, demonstration, and evaluation of the analysis predictions. Testing provides progressive assurance and final proof that contractual requirements can be, and are, achieved. The analysis identifies the support elements and maintenance tasks which are being tested. The test results are used to compile a record of all maintenance tasks performed, time expended, resources used, skills needed, and deficiencies discovered. The test results are analyzed, the LSAR is updated with the test data, and action is taken to correct deficiencies in the support system.

3-2. The Coordinated Test Program. a. Test and evaluation provides information about the system's capabilities and assesses its military worth. The information is needed in the decision making process to reduce acquisition risks. All system/equipment testing requirements, including the logistic support tests and demonstrations (TM 38-710), the physical teardown and evaluation (DARCOM supplement to AR 700-127), and maintainability verfication/demonstration/evaluation (MIL-STD-471A) will be accomplished in accordance with the Coordinated Test Program (CTP), AR 70-10.

b. The CTP forms Section IV of the Development Plan. The CTP defines the critical issues which the testing must resolve. In addition to requiring resolution of these critical issues, the detailed test plans implementing the CTP will require testing and evaluation of the performance and the logistic support characteristics described in Sections II and VI, respectively, of the DP.

c. The tests are categorized as Development Test (DT) or Operational Test (OT). In general, DT determines the technical adequacy of the item's design, while OT measures its military worth and suitability. DT is conducted by the materiel developer and OT is conducted by the Operation Test and Evaluation Agency (OTEA) or other designated test acitvity. The two categories of testing may be combined and conducted jointly and concurrently; however, the reports are always submitted and evaluated separately.

3-3. Logistic Support Testing. The CTP and detailed test plans for DT and OT will contain specific test objectives, criteria for measuring the achievement of maintainability characteristics and logistic support goals, and describe how the test is to be performed. The test phases in the procurement cycle are illustrated in figure 3-1.

a. Test objectives. Test and evaluation of system/equipment will include a maintenance test support package (AR 750-1) and a training test support package. The maintenance test support package (MTSP) includes:

(1) Equipment publications.

(2) Repair parts; accessories; special and common tools; test, measurement and diagnostic equipment (TMDE); ground handling, calibration, safety, and other support equipment.

(3) Special facilities.

(4) Personnel skill requirements.

The training test support package includes training aids and devices, training literature, programs of instruction, and other selected items.

b. Evaluation Criteria. Test plans must include accept/reject decision criteria which define what factors contribute successful achievement of design goals. By the same token, this requires that the term "failure" be defined. These failure definitions and scoring criteria are necessary for consistent evaluation of test results.

c. Testing.

(1) Logistic support testing will normally be conducted concurrently with the system/equipment testing. In this expected circumstance, detailed plans for DT/OT testing will include annexes which cover the logistic support testing. If this testing is not conducted concurrently with system/equipment testing, separate detailed test plans must be prepared.

(2) In addition to the information in paragraphs 3-3a and 3-3b above, detailed plans or annexes will describe:

(a) When the testing will be done.

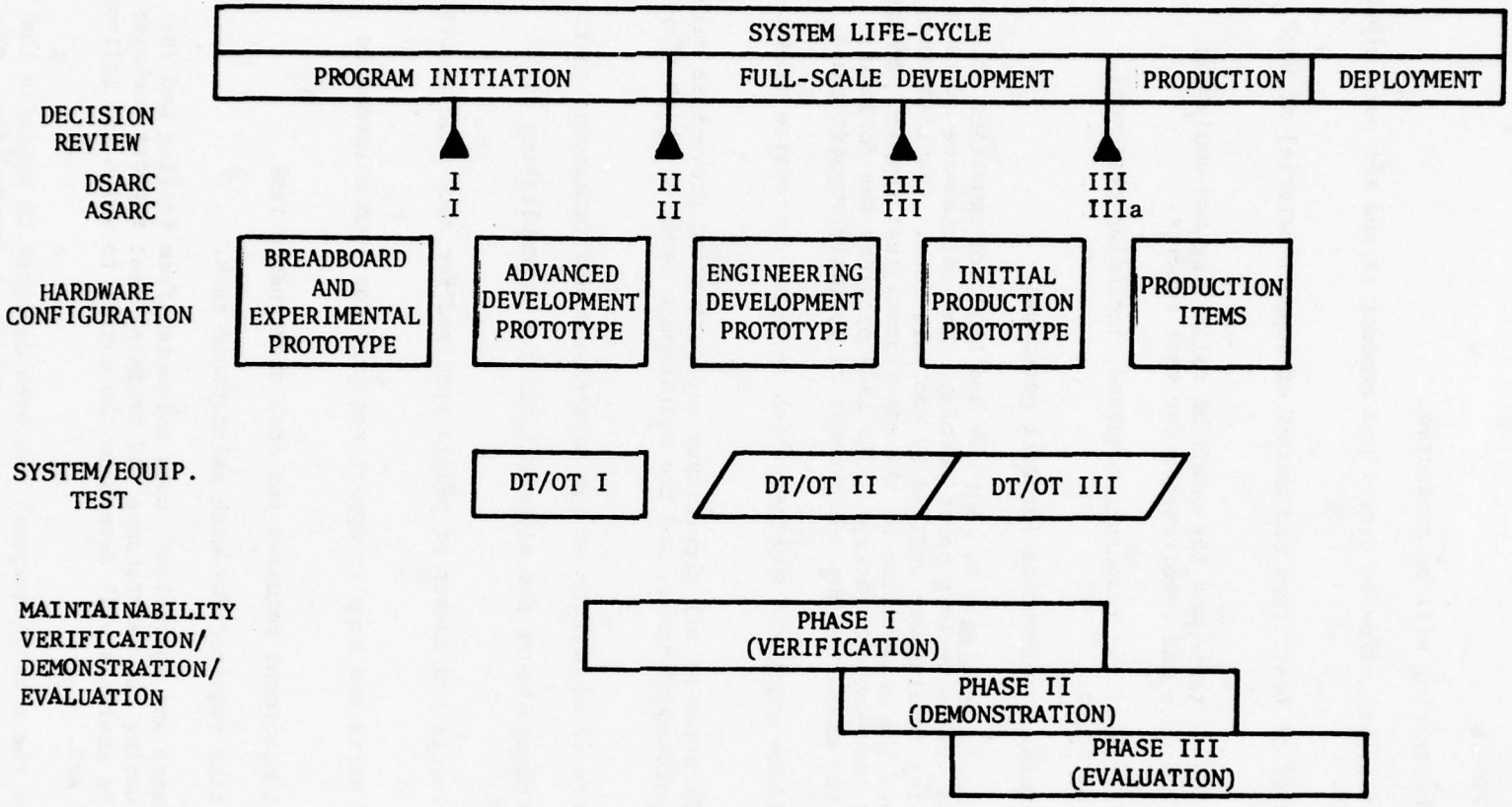

FIGURE 3-1. TEST PHASES

(b) Where the testing will be conducted.

(c) The test organization to direct and conduct it, and the participating agencies.

(d) The number of test items and amount of support materiel at each test site.

(e) Definition of terms, and the means of collecting and analyzing maintenance and RAM data and requirements for test reports.

(f) A tabulation of the resources required, including personnel, facilities, and materiel.

(g) The training requirements for test personnel.

3-4. The LSA Role in Testing. a. The LSA and LSAR are important to the accomplishment of the logistic support testing. The maintenance tasks to be demonstrated during testing are defined by analysis data. The LSAR contains the data to select the composition of the maintenance test support package and the training test support package. The LSAR provides the following prediction data for measuring the achievement of logistic support goals.

(1) The failure modes and symptoms which initiate corrective maintenance tasks.

(2) Identification of all significant corrective and preventive maintenance tasks, turnaround tasks, and the maintenance level at which they are performed.

(3) Frequency of occurrence of the maintenance and turnaround tasks.

(4) Predicted man-hours and elapsed times for accomplishing each maintenance task.

(5) Skill levels and number of people required for each maintenance task.

(6) Repair parts and supply support required for each maintenance task.

(7) Support equipment required for each maintenance task.

(8) Facilities required for each maintenance task.

b. Maintenance and operational data collected from testing and the results of evaluating the maintenance and training test support packages will be analyzed. The analysis will determine the extent to which the following goals have been met.

(1) Whether the system/equipment has been designed to minimize the maintenance man-hour requirements and the requirement for modified, new, or specialized skill requirements.

(2) Whether the materiel has been designed to minimize the requirement for new or peculiar support equipment.

(3) Whether maintenance operations can be accomplished by the identified personnel skills, using the items of materiel in the maintenance test support package.

(4) The achievement of contractual maintenance and reliability, availability, and maintainability characteristics.

c. The test results are used to compile a maintenance record of all maintenance tasks performed, time expended, repair parts used, skills needed, and deficiencies discovered. The test results are analyzed, the LSAR is updated with the test data, and action is taken to correct deficiencies. Evaluation of the test results will determine:

(1) The adequacy of equipment publications.

(2) The adequacy of the quantity and range of repair parts selection.

(3) The adequacy, need for, and compatibility of tools and support equipment.

(4) The adequacy and need for personnel skill requirements and training.

(5) The reliability, availability, and maintainability characteristics of the support equipment items.

3-5. Evaluation. a. Table 3-1, which is taken from AMCP 706-132, Maintenance Engineering Techniques, is presented here because of its wide potential application. The table lists the most important maintenance objectives and most important maintenance parameters that contribute to the attainment of the objectives. It is universally applicable to all materiel, not only as a design tool, but as tool for evaluating both design and the LSA effort.

b. The conventional approach to evaluation is to compare results to requirements. This approach will demonstrate in absolute terms whether the requirements have been met, but will not indicate whether the results are the best that can be achieved. Table 3-1 lists maintenance objectives in qualitative rather than absolute quantitative values, and when used with imagination can reveal opportunities for improving and minimizing maintenance.

TABLE 3-1. MATERIEL MAINTENANCE OBJECTIVES VS MAINTENANCE PARAMETERS

1. Minimize maintenance frequency by using:
   - Maintenance-free design
   - Standard and proven design and components
   - Simple, reliable, and durable design and components
   - Fail-safe features to reduce failure consequences
   - "Worst case" design techniques and tolerances that allow for use and wear throughout item life.

2. Minimize maintenance downtime by designing for rapid and positive:
   - Prediction or detection of malfunction or degradation
   - Localization to the affected assembly, rack, or unit
   - Isolation to a replaceable or repairable module or part
   - Correction by replacement, adjustment, or repair
   - Verification of correction and serviceability
   - Identification of parts, test points, and connections
   - Calibration, adjustment, servicing, and testing.

3. Minimize maintenance costs by designing for minimum:
   - Hazards to personnel and equipment
   - Depot or factory maintenance
   - Consumption rates and costs of repair parts and materials
   - Erroneous indications of failure
   - Personnel skills and quantities.

4. Minimize maintenance complexity by designing for:
   - Compatibility between materiel and support equipment
   - Standardization of design, parts, and nomenclature
   - Interchangeability of like components, material, and repair parts
   - Minimum maintenance tools, accessories, and equipment
   - Adequate accessibility, work space, and work clearances.

5. Minimize maintenance personnel requirements by designing for:
   - Logical and sequential function and task allocations
   - Easy handling, mobility, transportability, and storability
   - Minimum numbers of personnel and maintenance specialities
   - Simple and valid maintenance procedures and instructions.

6. Minimize maintenance errors by designing to reduce:
   - Liklihood of undetected failure or degradation
   - Maintenance waste, oversight, misuse, or abuse
   - Dangerous, dirty, awkward, or tedious job elements
   - Ambiguity in labeling or coding.

CHAPTER 4

ANALYSIS TECHNIQUES AND AIDS

4-1. Analysis Techniques. a. Logistic support analysis is the generic name of a number of techniques which are themselves areas of specialization. Included among these techniques are:

(1) Logistic support testing.

(2) Life-cycle logistic cost analysis.

(3) Logistic support modeling.

(4) Logistic risk analysis.

(5) Design/support trade-off analysis.

Testing is addressed in Chapter 3. Life cycle cost analysis is discussed in Chapter VII of TM 38-710, ILS Implementation Guide for DOD Systems and Equipment.

b. Logistic Support Modeling. (1) A great many maintenance and support characteristics must be evaluated and integrated. Scientific techniques rather than intuition must be used to quantitatively assess the effects of the characteristics on the operation of the support system. The way to test the effects without actually assembling the system, is to construct a model. Logistic support models are mathematical models; they may be further subdivided into analytical and simulation models. There is not enough space here to go into an in-depth discussion of modeling; however, an excellent pamphlet, DA Pamphlet 750-21, Logistic Support Modeling, is aimed specifically at answering questions for personnel engaged in developing logistic support.

(2) Typical products of the mathematical models used in logistic support studies include availability, operational readiness, repair part usage data, man-hour requirements, and system costs. Derived data reflect the basic LSA data and the influence of data from other sources, such as transportation, storage, and handling.

(3) Basic LSA data required by typical support models include information relating to failure rates, utilization rates, repair rates, repair policy, indenture levels, location of repair actions, spares policy, and cost.

(4) Support modeling techniques can be applied in all program life-cycle phases. Also, they can be applied effectively to various types of programs such as major system development and acquisition, subsystem or

component procurement, and off-the-shelf purchases. For example, during the development phase of a major acquisition, support modeling could be used to accomplish design/support trade-off studies which consider alternative design characteristics, maintenance support policies, and operational requirements. Support models can also be used to evaluate the compatibility of projected maintenance requirements for new equipment with the proposed table of organization and equipment (TOE) structures.

(5) There are several maintenance support optimization models available within the Army. Some of them do this optimization in conjunction with examining life-cycle supports costs, availability, and operational effectiveness. Available support models are identified in AMCP 750-11, Support Model Reference List. Three of the more prominent models are the Generalized Electronic Maintenance Model (GEMM), developed by the US Army Electronic Command (ECOM); the Cost Analysis of Maintenance Policies (COAMP) model, developed by RCA Corporation and adapted for use at MICOM and ARMCOM; and the Replacement Unit Repair Level Analysis Model (RURLAM), developed by the Army Management Engineering Training Agency (AMETA). An evaluation of these three models is contained in a study entitled, "Evaluation of Maintenance Support Optimization Models", available from the Defense Documentation Center as report number AD 761112.

c. Logistic Risk Analysis. (1) Actions/effects may be categorized for decision making as follows:

(a) Certainty--Each action leads to a known specific outcome.

(b) Risk--Each action leads to one of a set of possible outcomes and each possible outcome has a known probability.

(c) Uncertainty--Each action leads to an effect, but the probabilities, or perhaps even the outcomes, are unknown. Uncertainties may be further classified as things you know you don't know and things you don't know you don't know. The purpose of risk analysis is to eliminate as many of the uncertainties as possible by assigning risks.

(2) A risk analysis should identify the following areas:

(a) Potential Problems.

(b) Consequences of failure.

(c) Low-risk program areas.

(d) Requirements versus state-of-the-art trade-offs.

(e) Schedule and funding adequacy.

(f) Fund allocation.

(g) Data gaps/recommended studies.

(h) Sensitive/critical parameters.

Once problem areas have been identified, the other analytical techniques described in this chapter are used to find solutions (certainties) or assign risks (probabilities).

(3) There are three distinct phases when risk analysis is particularly important; they are the conceptual phase, the development phase, and the production phase. A risk analysis conducted during the conceptual phase is primarily concerned with assessing technical risk; i.e., technical problems, consequences of failure, judgment of efforts needed for a practical solution and cost/risk trade-offs between engineering/design requirements and logistic support/maintenance considerations. The development phase objectives are to identify high risk elements, verify technical approaches, and establish firm schedule and cost estimates. Prior to any large-scale production commitment, the program must again be assessed and results of development testing reviewed to ensure that uncertainties and risks have been eliminated or are manageable.

d. Design/Support Trade-Off Analysis. (1) Trade-off analysis is the process of analyzing and evaluating possible solutions to a problem and choosing the one that best satisfies the explicit and implicit constraints. Explicit constraints are performance factors such as speed, accuracy, maintainability, or reliability. Implicit constraints may be tangible, such as state-of-the-art limitations, or intangible, such as user acceptance of a new concept.

(2) Formal trade-off analyses conducted during the conceptual phase become Part II of the Concept Formulation Package which is required before the program can be approved to enter the development phase. These trade-offs are used to select the system that best balances:

(a) Mission and performance envelopes.

(b) Technical options.

(c) Life-cycle costs (RDTE, PEMA, OMA, and MCA).

(d) Production unit cost.

(e) Scheduling.

(f) Human factors.

(g) Operational and organizational effectiveness.

(h) Logistic support considerations.

(i) Environmental and ecological considerations.

(3) Trade-offs in the conceptual phase and early in development are usually interdisciplinary, that is, among the system's major characteristics

listed above. As development proceeds, trade-offs become more intra-disciplinary. For example, support characteristics will be traded-off against one another. The interdisciplinary trade-offs have the potential for major impacts on design, system support, and cost. The validity and necessity of design characteristics which impose support requirements should be challenged at this early time. Logistic support inputs with major design impacts must be made early to be accepted.

4-2. Analysis Aids. a. In addition to the basic LSA techniques above, a variety of analysis aids are available. These aids are not a substitute for experience and judgment, and the reader should be aware of this limitation.

b. Checklists. (1) Checklists are used to evaluate the completeness and adequacy of the analysis. They are a valuable aid to prevent overlooking important maintenance features. These lists are usually a series of questions that can be answered by a simple "yes" or "no." The completed checklist may be incorporated into the reviewed document as additional validation of data. Checklists may also be incorporated into the LSAR in accordance with instructions contained in paragraph B-3a of Appendix B.

(2) Numerous sample checklists are available for the manager, administrator, or technician. They are used to check drawings, the completeness of staff work, RFP's, contractual documents, equipment interchangeability, safety, servicing, etc. The following documents contain suggested checklists that are applicable to the LSA process.

(a) TM 38-760-1, A Guide to System Engineering.

(b) MIL-HDBK-472, Maintainability Prediction.

(c) AMCP 706-134, Engineering Design Handbook, Maintainability Guide for Design.

c. Block Diagrams. (1) Block diagrams are used as a shorthand way of depicting system design. The most important for LSA purposes are functional flow block diagrams, component block diagrams, and schematic block diagrams.

(2) Functional flow block diagrams (FFBD) show the system's support structure as basic functional requirements. These maintenance and support functional requirements are goals that early analysis and planning seek to satisfy. Functional flow block diagrams show the necessary functions at each level of the work breakdown structure. Top level FFBD's show the gross functions that must be accomplished in system maintenance activities. The first level, second level, etc., diagrams represent progressive expansions of individual functions of the preceding level. The blocks are arranged to show the necessary order of functions and the alternate/parallel functional sequences. Diagrams prepared during maintenance function analysis are formulated using the same methods and symbol conventions used by system

engineering for the functional performance requirements (such as the basic rules for the physical layout of FFBD's contained in TM 38-760-1, A Guide to System Engineering). FFBD's are primarily developed to communicate system requirements; therefore, the use of appropriate abbreviations, leader notes to a condition at a decision gate, reference to specifications or trade-off studies, or comments on such things as the scope of the programs or limitation of the analysis are all encouraged when they will clarify or simplify the drawings.

(3) Component block diagrams are one of the first inputs to the LSA process from design engineering which describe actual hardware approaches under consideration. They are used to relate support significant aspects to the system design approaches. For example: relating maintainability parameters to various levels of system hardware is effectively accomplished via component block diagrams. Another example is their use for listing malfunction symptoms associated with equipment. These form the bases for developing logic trees for fault detection and fault isolation.

(4) Schematic block diagrams show the functional interrelationship of hydraulic, mechanical, or electrical components. They assist in explaining equipment operation for writing maintenance instructions, training, troubleshooting, and establishing test points.

d. Maintenance Engineering Simplified Sheets. (1) LSAR data sheets are not initiated for an item until its configuration is stabilized. That is, not until all design alternatives have been weighed, and the item's functional and performance characteristics are sufficiently defined for failure modes and frequency to be predicted. The maintenance engineering simplified sheets are a suggested format for compiling the LSA evaluation of design alternatives prior to LSAR data sheet initiation. This initial LSA effort evaluates the effects of hardware alternatives on support costs and operational readiness for use in trade-off studies. Trade-off determinations and the results of trade-off studies are part of the concept formulation package which must be approved before development may proceed. Use of the simplified sheets is optional. There are two formats; sheet 1 documents logistic inputs to conceptual studies and cost models. Sheet 2 is for evaluating the logistic implications of hardware alternatives.

(2) Sheet 1 (Figure 4-1).

(a) Use. Sheet 1 formats logistic decision factors for comparison of alternatives. This sheet can be used to provide logistic inputs to life-cycle cost studies. Figures of merit, such as the ratio of operational readiness to life-cycle cost, can be used to evaluate maintenance alternatives.

(b) Preparation instructions.

1 Cost. Cost data for all alternatives under study. Cost figures will be life-cycle costs unless otherwise specified. All costs of the individual support elements are combined into the categories of operation, maintenance, supply, transportation, training, and equipment publications.

2 Effectiveness. The parameters to be recorded here are operational readiness figures, along with any other effectiveness parameters being addressed by the study.

3 Schedule. The Initial Operational Capability (IOC) date and any other significant dates.

4 Related factors. Related factors which have an impact on the choice between alternatives. These factors include such things as safety, environmental and pollution control, waste disposal, special storage, international logistics, political influences, etc.

5 Remarks. Additional information needed to clarify or qualify the parameters on the sheet.

(3) Sheet 2 (Figure 4-2).

(a) Use. Sheet 2 is used to synthesize support approaches prior to the establishment of a firm hardware configuration. It provides a way of comparing alternative concepts for impact on system readiness, capability and cost at an early enough time so that design features can be challenged on the basis of logistic support considerations.

(b) Preparation instructions.

1 Group Code. Hardware indenture code of the item. Ideally this would be the same code as used on the LSAR data sheets (FGC/WBS/WUC), but it may be the component end item (CEI) number or other code.

2 Nomenclature. The name of the item or performance function.

3 Failure Rate. The expected failure rate for the item or function. The failure rate is an important basis for decisions on a maintenance approach and it should be included. It may be desirable to state a performance band rather than a single value. If the maintenance factor (DARCOM Pamphlet 750-5) is already known, it may be used.

4 Maintenance Function. See the functions listed under "Task Function Code" on Data Sheet C, appendix B.

5 Equipment Status. The condition of the end item or next higher assembly during performance of the maintenance function (power on and working; system on standby; system down, etc.). This is important to evaluate the effect upon system availability.

6 Performed When. This is indicative of the frequency of the maintenance function. This entry should indicate whether the maintenance function is required as a result of a failure (corrective maintenance) or whether the function is to be performed at some interval of calendar, operating time, cycles, or other measure for preventive or periodic functions. Indicate if the function is required in conjunction with or as

MAINTENANCE ENGINEERING SIMPLIFIED SHEET #1

ITEM:

Page _____ of _____

LOGISTIC DECISION FACTORS	ALT A	ALT B	ALT C	ALT D	ALT E	REMARKS
COST						
OPERATION:						
PERSONNEL - - - - - - - - - - -						
SUPPLIES - - - - - - - - - - -						
TOTAL - - - - - - - - - - - - -						
MAINTENANCE:						
PERSONNEL - - - - - - - - - - -						
EQUIPMENT - - - - - - - - - - -						
TOTAL - - - - - - - - - - - - -						
SUPPLY:						
ITEM INTRO & MGT - - - - - - - -						
REPAIR PARTS - - - - - - - - - -						
TRANSPORTATION - - - - - - - - -						
TRAINING - - - - - - - - - - - -						
EQUIPMENT PUBLICATIONS - - - - -						
EFFECTIVENESS						
O. R. - - - - - - - - - - - - - -						
OTHER - - - - - - - - - - - - - -						
SCHEDULE						
I. O. C. DATE - - - - - - - - - - -						
OTHER - - - - - - - - - - - - - -						
RELATED FACTORS						
SAFETY - - - - - - - - - - - - -						
ENVIRONMENTAL - - - - - - - - - -						
OTHER - - - - - - - - - - - - - -						

FIGURE 4-1. SIMPLIFIED SHEET 1

a result of another function such as an "align" or "adjust" function being required after performing a repair function.

7 Performed At. The maintenance level or category which performs the function. In many cases, the maintenance level will be one of the variables in the alternative concepts. If a maintenance concept varies from the normal Army maintenance organizational structure, it should be so indicated and fully explained in the accompanying remarks section.

8 Performed By. Indicate the man/machine maintenance task allocation by maintenance concept. This is needed to evaluate different approaches to built-in test equipment (BITE), digital techniques, separate automated equipment, and manual methods.

9 TMDE. The test, measurement, and diagnostic equipment needed to accomplish the maintenance function. The type of equipment envisioned (manual, semiautomatic, or fully automatic) should be indicated, if appropriate for evaluation purposes, as well as whether the equipment will be located on or off the end item. Additionally, indicate if the function is to be accomplished by a piece of TMDE located at a higher or lower hardware indenture level. An example of this would be a navigational computer whose BITE has isolated a fault to a plug-in repairable module. Sheet 2 entries against the module would indicate that although the fault detection was automatic, it was accomplished by equipment associated with a higher level assembly and actually requires no TMDE for the module itself.

10 Personnel. Personnel required to perform the maintenance function. Identify the skill requirements by MOS or some other manner of conveying the level of ability needed to perform the function. For example; by assigning an arbitrary skill scale of 1 to 4 to the degree of skill or training required.

11 Maintenance Time. Time to perform the maintenance function.

12 Remarks. Any explanatory information needed. If a separate remarks sheet is used, this column may contain an identifying code. Cost information, weight and cube data, calibration considerations, or some variation of standard Army maintenance procedure, such as decentralized direct support, are the type of things that should be explained in remarks.

e. Experience Data Systems. (1) Operational availability depends upon the successful incorporation of reliability, maintainability, and logistic support requirements into the design. Data relative to these factors, whether acquired by analysis or accumulated by experience in the field, are needed as a new system progresses through all phases of development. Many program management and technical decisions affecting materiel acquisition are made on the basis of the analysis of historical data. The data systems referred to in this section are the data management systems that collect, process, and store experience data. Experience data play important roles in:

(a) Predicting reliability.

MAINTENANCE ENGINEERING SIMPLIFIED SHEET #2

ITEM:

Page _____ of _____

GROUP CODE	NOMENCLATURE	FAIL RATE			MAINT FUNCTION	EQUIP STATUS	PERFORMED WHEN	PERFORMED AT	PERFORMED BY	TMDE		PERSONNEL		MAINT TIME	REMARKS
		MIN	EXP	MAX						TYPE	LOCATION	NO.	SKILL		

FIGURE 4-2. SIMPLIFIED SHEET 2

(b) Predicting maintainability.

(c) Predicting availability.

(d) Developing maintenance and logistic support concepts.

(e) Predicting preventive and corrective maintenance requirements.

(f) Determining qualitative and quantitative personnel requirements.

(g) Determining support resources such as initial repair parts, publications, support equipment, and facilities.

(h) Preparing modeling and simulation programs.

(2) Early in acquisition, these data are used to establish performance bands and logistic requirements. Prediction consists of the initial trade-off studies and simulation modeling to establish system parameters. The optimization process is the continued study, analysis, definition, and refinement necessary to arrive at logistic and design concepts. Performance data used for objective analyses must meet two standards. First, the data must be accurate. Second, there must be enough data to produce valid and meaningful findings. Although an enormous volume of performance data has been accumulated, the user should be cautious about its quality. A great deal of the field data which has been collected is of doubtful value except for establishing trends.

(3) The problem of quantity is often solved by graphics. The data are presented by computer drawn charts, curves, etc., which condense the volume of data elements. Also, through controlled "accessibility", a batch of data may be isolated and extracted to serve a particular purpose. Both the designer and logistician depend on performance and failure data feedback from a wide range of applications and use environments to optimize system requirements. Some specific sources of such data follow.

(4) MIL-HDBK-217A, Reliability Stress Analysis for Electronic Equipment. This handbook is a source of failure data for standard electronic and electromechanical parts under electrical and thermal stresses.

(5) TM 38-750, The Army Maintenance Management System (TAMMS). Essential data concerning equipment operation and maintenance are recorded in TAMMS. The objective is to record the minimum of data, yet record all that are required for control, operation, and maintenance of equipment at each level of command. The sample data collection (AR 750-37) program has been established to provide for collecting more detailed maintenance and operational performance data on individually approved items of equipment. Sample data collection utilizes TAMMS reporting forms, but some variations are possible.

(6) AMCR 70-56, Government-Industry Data Exchange Program (GIDEP). GIDEP currently contains four data banks: the Engineering Data Bank, the

Metrology Data Bank, the Failure Experience Data Bank, and the Failure Rate Data Bank. All GIDEP participants may have access to each of these data banks on a limited basis. A summary of the information contained in each data bank follows:

(a) The Engineering Data Bank includes information on parts, components, materials, manufacturing processes, and related technical test data. The test data are primarily results from environmental testing as conducted by participating contractors, associated subcontractors, and certain activities of the Government agencies who are engaged in design, development, and production of military aerospace equipment for the Government.

(b) The Metrology Data Bank includes calibration procedures which are the results of technical reports prepared to calibrate the instrumentation required for the attainment of repeatable accurate test results.

(c) The Failure Experience Data Bank includes information on known and/or suspected defective parts identified by Government and industry sources.

(d) The Failure Rate Data Bank includes failure rate, failure mode, replacement rate, and maintenance data on parts, components, and assemblies. The data bank includes both field experience data and reliability demonstration test data.

f. Logistic Support Analysis Data. (1) A valuable aid to conducting the analysis is an organized method of recording analysis data. This function is fulfilled by the LSAR described in appendix B. A system for storing and retrieving the data obtained through the analysis techniques described in this chapter is a necessity. The analysis serves no useful purpose unless the data are accessible to those who need and will use it.

(2) The LSAR was designed to take advantage of computer technology. Computer produced summarizations of data permit instant visibility of data for total support requirements. Besides the LSAR's value as a data base, its input data sheets act as a checklist for performing the analysis by indicating what data are required. However, one must not forget that the objective of the LSA is to optimize and define a support system and not merely produce data.

Appendix A
SAMPLE WORK STATEMENTS

A-1. This appendix presents a sample LSA contract work statement. Two standard Data Item Descriptions (DID's) to support this work statement are available in the Authorized Data List (ADL), TD-3. DI-S-1818A, Logistic Support Analysis Record (LSAR) Data, is an Army peculiar DID; DI-S-7017, Logistic Support Analysis (LSA) Plan is authorized for DOD-wide use. These sample work statements, and when necessary the authorized DID's, should be tailored to the specific acquisition program objectives.

A-2. The sample work statement contains qualitative requirements necessary to interface the LSA and test programs with each other and with coincident system/equipment programs. Additional work statements for reliability, maintainability, system/equipment test, and the ILS program would be required. Other work statements/data item descriptions are necessary to list the specific techniques to be used for life-cycle cost, trade-off, and risk analyses, and for support modeling.

Appendix A--Continued

SAMPLE WORK STATEMENT
FOR A
LOGISTIC SUPPORT ANALYSIS PROGRAM

1. Program Establishment. The contractor shall plan, manage, and execute a logistic support analysis (LSA) program and accomplish the analysis tasks described in MIL-STD-1388-1, paragraph 5.8. The objectives of the LSA shall be: early identification and correction of any-support, maintainability, and reliability problems inherent to the proposed design; creation of a positive design influence toward optimum materiel readiness and economical logistic support; and identification and evaluation of resources required to develop, acquire, and manage a support system.

2. Program Planning. The contractor shall submit an LSA Plan in the format prescribed by the Contract Data Requirements List (CDRL, DD Form 1423).

3. LSA Criteria. Systems, end items, components, assemblies, subassemblies, support and test equipment, and training equipment that require documentation of operational and logistic support requirements and for which the Government does not have an organic maintenance capability shall be candidates for LSA. Maintenance capability as used in this context includes, but is not limited to, trained personnel; transportation and handling; logistic technical data; support and test equipment; supply support; and facilities. Unless otherwise specified in the contract, the following material shall be candidates for LSA:

(a) Contractor-furnished installed equipment items that can or will be repaired, maintained, or overhauled as part ("on-equipment" maintenance) of the system/equipment.

(b) Contractor furnished installed equipment items that can or will be repaired, maintained, or overhauled separately ("off-equipment" maintenance) from the system, end item, component, assembly, or subassembly with which they are functionally associated.

(c) Contractor furnished non-installed equipment, to include support and test equipment and training equipment.

(d) Installed and non-installed Government furnished equipment (GFE) items when such analyses are required to interface GFE with contractor furnished equipment and/or determine total support requirements of the contract end item(s).

Appendix A--Continued

(e) Installed and non-installed GFE items for which Government furnished data are inadequate or incompatible, and where such data are necessary to fulfill contract requirements.

(f) Connecting and installation hardware, bracketry, standard hardware items, bulk materiel, and simple parts, which are not economically reparable, shall be included in the LSA documentation for the next higher assembly.

4. LSA Candidate Selection Procedures. Unless otherwise specified in appropriate contract addenda, the selection process for LSA candidates shall be governed by the following procedures:

(a) The contractor shall prepare an initial list of LSA candidates in consonance with the criteria of paragraph 3. The list shall include LSA control number, National Stock Number/manufacturer's part number, and item name as available. The initial list of LSA candidates shall be included in the initial LSA plan submission, and shall be augmented by the contractor as design engineering progresses.

(b) The source selection evaluation board and/or ILS Management Team/Logistic Support Planning Team will review and approve candidates on the initial list. Subsequent supplemental lists of candidates will be reviewed by the ILSMT/LSPT and those items which are selected for LSA will be approved by it.

5. Duplication of Effort. The LSA process is the interface between the materiel system design and support system design activities. The "LSA process" is an all-inclusive term for the analytical efforts which are used to define logistic support criteria and support system requirements. The contractor shall establish management controls and feed-back loops which preclude duplication of analysis effort in developing and documenting LSA data. Follow-on contracts with the same contractor or reprocurement contracts shall not require duplication of data or LSA effort except as specified in the contract or caused by changes in support requirements as defined in paragraph 6.

6. LSA Record (LSAR). Data and information generated by the LSA process shall be documented in a series of data sheets which, when assembled, constitute an LSAR. The LSAR shall be initiated concurrently with system/equipment design activities. LSAR data sheets shall be prepared and processed concurrently (NLT 30 days after preliminary drawing release) with design activity to insure a basis for logistic resource planning and trade-off decisions is established prior to hardware design freeze. The LSAR shall be developed as the central file of validated, integrated,

design-related logistic data pertaining to the acquisition program. LSAR data, in combination with technical reports and other ILS planning information shall be used to produce applicable deliverable data requirements listed in the CDRL. The LSAR shall be updated on a continuing basis. Contractor responsibility for updating shall continue throughout the contract period, until the system/equipment has achieved design stability, or as otherwise specified in the contract. Each update shall be considered as new data for the purposes of review, approval, and delivery. The contractor shall update the LSAR to reflect changes in support requirements resulting from:

(a) Changes to system/equipment design or mission/operational requirements.

(b) Logistic support improvements or the correction of deficiencies discovered through analysis of data from field and test data collection systems, test reports, formal design reviews, and by the contractor's validation of LSAR documentation.

(c) ILSMT/LSPT recommendations which result from Government data review.

7. LSAR Data Sheets. The contractor shall prepare LSAR data sheet formats in accordance with the CDRL and the instructions contained in DARCOM Pamphlet 750-16. Unless otherwise specified in the contract, the dimensions of the data sheets, method of entry (pen, pencil, typewriter, etc.) and filing system are optional with the contractor. Contractor proposals for substitution of other formats or the alteration or deletion of Government specified LSAR data sheets or LSA data elements shall require Government approval during contract negotiations. Where a Government specified data sheet does not provide sufficient space, the contractor has the option of preparing continuation sheets in the prescribed format. Continuation sheets and approved substitute or modified sheets shall include the item name, LSA control number, task code, page number, and date. The contractor may employ supplemental forms, worksheets, and other management devices in the LSA, but is not relieved of the requirement to deliver to the Government the LSA data and LSAR data sheets specified in the CDRL. The contractor shall identify approved deviations from Government specified LSAR formats and use of supplemental formats in the LSA plan.

8. Data Storage and Retrieval. The contractor shall establish and maintain an automatic data processing (ADP) system to record, store, and process LSAR data. ADP programs, program documentation, and technical assistance to establish the ADP system will be provided to the contractor

by the Government as resources permit. The contractor's request for ADP programs should identify the manufacturer and model number of the computer and medium by which the ADP programs are to be furnished. Supplemental data such as functional block diagrams, decision trees, troubleshooting charts, sketches, etc., may be incorporated into LSAR hardcopy storage by entering the control fields (LSA control number and task code when applicable) on the supplemental data. The filing system for storing and retrieving hardcopy LSAR data is optional with the contractor.

9. LSA Control Numbers. The contractor shall assign LSA control numbers to individual equipment items and equipment groupings to facilitate ADP storage and retrieval. The structure of the number shall represent a hardware generation breakdown/disassembly sequence of system/equipment hardware including support and test equipment, training equipment, and installation (connecting) hardware items. Each item in the system/equipment from the contract end item(s) down to each individual piece-part, shall be assigned a unique LSA control number for each system/equipment application of the item to identify its relationship to its next higher assembly. The contractor is responsible for insuring the compatibility and integration of subcontractor/vendor LSA control numbers within the overall coding arrangement. The first character of the code (system/equipment identifier) may be assigned by the procuring activity for accountability in a management information system. Additional characters may also be assigned by the procuring activity to maintain compatibility within Work Breakdown Structure codes, the Commodity Command Standard System (CCSS), and other management requirements. The contractor's proposed numbering system shall be described in the LSA plan and requires Government approval.

10. LSA Validation, Review, and Approval. The contractor shall establish internal procedures for progressive validation of the adequacy and technical accuracy of LSAR documentation. The Government will periodically review and examine contractor-produced LSAR to evaluate the contractor's compliance with and satisfactory progess toward accomplishing the requirements of this contract. The contractor shall participate in, and provide administrative support (facilities, office equipment, personnel, prototype models and mock-ups, and technical data) for these Government reviews at or in the vicinity of the contractor's plant. Government approval of contractor LSAR documentation does not imply approval of a design change proposed as a result of LSA. Approval of such changes shall be obtained through the normal contractual process. LSA data shall be available at formal government design reviews to verify the adequacy of the data and the supportability of the design.

Appendix A--Continued

11. Data Delivery. The contractor shall submit periodic and final LSAR documentation to the Government in accordance with the requirements of the CDRL.

Appendix B

LOGISTIC SUPPORT ANALYSIS RECORD

1. Purpose. This section contains Logistic Support Analysis Record (LSAR) standard data sheet formats, and associated instructions and definitions. The LSAR output summaries are also shown and guidance is provided for data utilization.

2. Concept. a. The LSAR provides a standardized medium for systematically recording, processing, storing, and reporting analysis data. The data sheets also serve as a checklist of the decisions required to identify support requirements and evaluate the supportability of system/equipment design. The standardized formats are not intended to set a limit upon the scope of analysis effort, but take advantage of the benefits to be derived from a common data base and computer technology.

b. The data in the LSAR may be recorded using automatic data processing (ADP) equipment, microfilm, or manual methods, as specified in the contract. The LSAR is structured to be fully compatible with computer technology; however, automation is not essential to its functioning. While it is entirely possible to manually produce the output summaries, it is not feasible to do so except for the simplest of systems.

c. Computer programs (ANSI COBOL) have been developed for the standard data sheets to produce the output summary formats described in paragraph 4. These programs can be tailored to suit individual commodities and development efforts. The programs are provided free to contractors as Government-furnished property. The availability of these programs results in a substantial cost savings by eliminating the need to independently develop them for each development effort. A User's Guide, Job Control Language (JCL) Package, and an ADP Guide for Functional Personnel are available with the computer programs. These three manuals will tell the contractor's ADP personnel all they need to know in order to input and output data and to operate the programs without becoming involved with the internal programing intricacies.

3. Input Data Sheets. a. The contractor shall prepare the data sheets in accordance with the formats and instructions contained in this appendix. Unless otherwise specified in the contract, the dimensions of the data sheets and the method of entry (pen, pencil, typewriter, etc.) are optional with the contractor. Contractor proposals for revised data sheet formats or data element definitions will require procuring activity approval during contract negotiation. Where the data sheet does not provide sufficient space, the

contractor has the option of preparing continuation sheets in the prescribed format. Such additional sheets shall include the item name, FGC/WBS/WUC, page number, and date. Supplementary data such as block diagrams, decision trees, trouble shooting charts, sketches, etc., may be incorporated into the hardcopy storage by entering the control fields (FGC/WBS/WUC and Task Code when applicable) on the supplemental data. The contractor may employ supplemental in-house forms, worksheets, and other management devices, but is not relieved of the requirement to deliver to the Government the LSA data specified in the contract.

b. Detailed instructions for filling out the data fields on each data sheet are contained in paragraph B-5. The definitions and data element dictionary contained in paragraph B-6 shall be used. The following general rules apply.

(1) Three spaces are provided on each data sheet to enter the sequential page number when a particular sheet has multiple pages. The page number will not be entered into the ADP system.

(2) Each data sheet will utilize a number of Hollerith 80 column punch cards when ADP equipment is employed. The relative position within the 80 column card count and the number of characters within the cards must be maintained on the A, C, and H records and the DØ4 and DØ7 cards of the D record for compatibility with the standard computer program. A data field length of four spaces is allowed to uniquely identify each card. The first space is an alpha entry to denote the applicable data sheet ("A" for Data Sheet A, etc). The next two positions are the numerical card number (Ø1, Ø2, Ø3, ..., 99). The fourth space is provided to make allowance for adding additional cards between any two adjacent cards. The use of alpha characters (A through Z) plus numeric characters (1 through 9) will adequately identify 35 additional cards. For cards AØ1 through A1Ø, cards CØ1 through CØ4, card DØ4 and card DØ7, the FGC/WBS/WUC must be entered in columns 5 through 15 and Task Code in columns 16 through 22 on cards CØ4, DØ4, and DØ7. For cards HØ1 through HØ4, Manufacturer's Part Number must be entered in columns 5 through 20 and for cards HØ5 through H2Ø, the FGC/WBS/WUC must be entered in columns 21 through 31.

(3) All blocks will contain positive entries unless otherwise specified in the instructions for the applicable field. If data are not available or are not required, leave the data block blank.

c. The detailed LSA control numbers (FGC/WBS/WUC) shall be developed by the contractor in accordance with procuring activity criteria. All data records are indexed by the LSA control number so extreme care should be exercised in assigning the code. The contractor must assure continuity and

compatibility of subcontractor and vendor prepared LSA data with the LSA control numbering system. The coding structure should represent a top-down generation breakdown of hardware. All items of support equipment, training equipment, etc., shall be assigned individual control numbers. When the standard Government ADP programs are used, trailing zeros (Ø) must not be entered in the FGC/WBS/WUC data blocks. Imbedded blanks are also not permissable.

(1) Figure B-1 is an example of how the coding structure is established. In this example, the first indenture level (system/equipment) is assigned a code zero (Ø). All LSA control numbers for this system must have a Ø as the first digit of the control number. In the same manner, each indenture level of the breakdown must begin with the control number of its next higher assembly.

(2) The second indenture level (subsystem) is uniquely identified by the second and third digits of the control number in this example. The number of digits used for any indenture level is flexible, but once established it must remain constant for that indenture level. For example, two digits may be used for the second indenture and three digits for the third indenture, but all second indenture items must use two digits and all third indenture items must use three digits. The procuring activity reserves the option of assigning the first and second indenture level numbers.

(3) If the identical item is used in more than one assembly (multiple application) it is assigned a different code for each application.

(4) Each item of support materiel is assigned a unique LSA control number. For example, each item of support equipment may be assigned a subsystem level (second indenture level) or all items of support equipment may be broken out (third indenture level) under one subsystem control number. Installation (connecting) hardware must also be assigned control numbers. The breakdown shown under ØØ1Ø9C (door installation) in figure B-1 illustrates a method of accounting for these items.

(5) If the hardware breakdown results in so many indenture levels that 11-digits cannot accommodate the requirement, lower indenture items may be assigned sequential control numbers. In this sequential number assignment, traceability to next higher assemblies will not be apparent from the LSA control number. LSAR output reports obtained for a particular assembly will not summarize information on its component parts if the computer cannot identify these parts from the LSA control number.

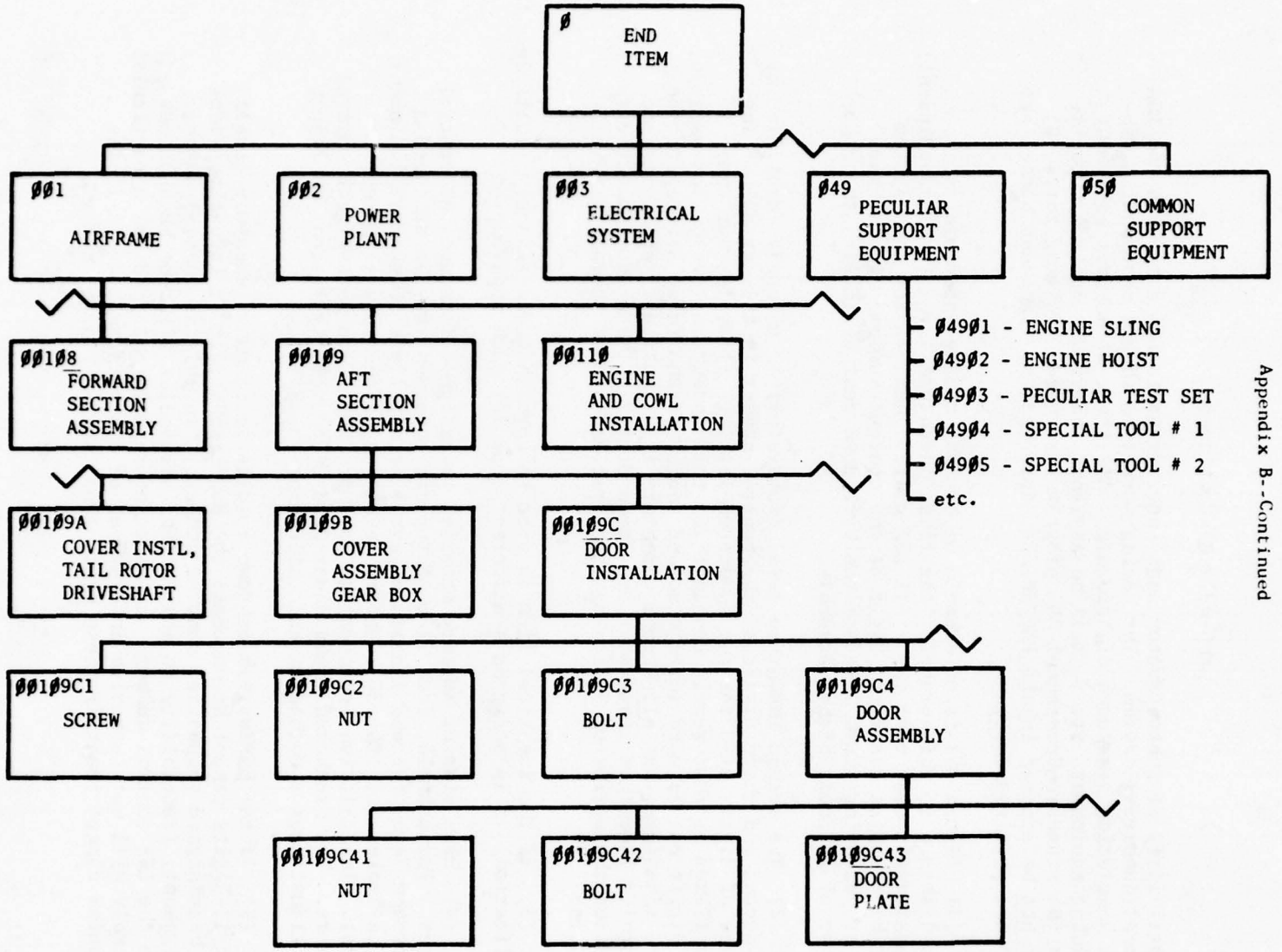

FIGURE B-1. LSA CONTROL NUMBER EXAMPLE

Appendix B--Continued

d. It should be noted that a complete data sheet will not necessarily be prepared all at one time, but will be filled as data become available or are updated. The alphabetical sequence of the data sheets does not denote the sequence of preparation. Table B-1 is a typical utilization of the data sheets from end item to piece-part. The necessity for completing Data Sheets "E", "F", and "G" depends on the requirements determined by the task analysis (Data Sheets "C" and "D").

Appendix B--Continued

	LSAR DATA SHEET							
	A	B	C	D	E	F	G	H
GFE/GFM	▲	▲	▲	▲	▲	▲	▲	▲
End Item	▲	X	X	X	●	●	●	X
System	●	X	X	X				X
Subsystem	●	X	X	X				X
Reparable Assembly		X	X	X				X
Nonreparable Assy/Part								X

▲ = Data provided by the procuring activity if available.

X = Data sheet normally required.

● = Data sheet dependent upon program requirements.

LSAR Data Sheet Formats:

A - Operations and Maintenance Requirements

B - Item Reliability (R) and Maintainability (M) Characteristics

C - Task Analysis Summary

D - Maintenance and Operator Task Analysis

E - Support and Test Equipment or Training Material Description and Justification

F - Facility Description and Justification

G - Skill Evaluation and Justification

H - Supply Support Requirements

TABLE B-1. LSAR DATA SHEET UTILIZATION

e. Data Sheet A, Operations and Maintenance Requirements. This data sheet is structured to consolidate the pertinent information related to:

(1) The anticipated operation of the system.

(2) The environment in which the system will be operated and maintained.

(3) The allocation of system maintenance requirements.

The data required for completion of Data Sheet A are normally provided by the Government. This Data Sheet is a checklist of maintenance allocations and should be available prior to initiation of full-scale development. An "A" sheet is prepared for the system and for each subsystem to the functional level for which maintenance requirements are to be imposed as a contract constraint. An "A" sheet should also be prepared for each Government-furnished subsystem to allocate that portion of maintenance requirements over which the contractor has little or no control. In addition to providing documentation for the maintenance requirements, Data Sheet A may be utilized to document the allocation of those requirements to lower indenture reparables. See figure B-2 for sample Data Sheet A.

DATA SHEET A: OPERATIONS AND MAINTENANCE REQUIREMENTS

PAGE 002

For use of this form, see AMCP 750-16.

Card Number 1-4: A01
1 FGC/WBS/WUC 5-15: 001
2 End Item Acronym Code 16-21: M1ST A1
3 Service Des Cd: A 22
4 FSCM 23-27: 22255
5 Alternative Action Code: A 28
6 Rev Code: A 29
7 Data Sheet Status: A 30
8 Dwg Class 31-33: A2Y
9 Serial Number Effectivity FROM: 300 TO: 400 34-53
10 Date 54-59: 761020 YR MO DA
11 Update Code: A 80

Card Number 1-4: A02
1 Item Name 16-34: ENGINE, GASOLINE
2 Type Model Series 35-60: GA3 31
3 Conversion Factor 61-64: 01.00
4 Update Code: A 80

Card Number 1-4: A03A
1 Mfr Part Number 16-31: 3A6294567 LRNC 32
2 FSCM 33-37: 22255
3 Drawing Number 38-53: 3A6294567 LRNC 54
4 FSCM 55-59: 22255
5 Update Code: A 80

MEASUREMENT BASE

Card Number 1-4: A04
1 Annual Operating Requirements: A 004000 16-21; B 23-28; C 30-35
2 Meas Base: A 22; 29; 36
3 Annual Number of Missions 37-42: 000040
4 Annual Operating Days 43-45: 100
5 Mean Mission Duration 46-50: 00167
6 Meas Base: M 51
7 Update Code: A 80

ORGANIZATIONAL MAINTENANCE

Card Number 1-4: A05
1 Maintenance Requirements 16-21
TASK INTERVAL Record to Tenths of Hours 22-71

A Number of Systems Supported	B Daily Insp		C Preoperative Insp		D Post Operative Insp		E Intermediate Insp		F Periodic Insp	
	Mean Elapsed Time	Mean Man Hrs	Mean Elapsed Time	Mean Man Hrs	Mean Elapsed Time	Mean Man Hrs	Mean Elapsed Time	Mean Man Hrs	Mean Elapsed Time	Mean Man Hrs
000016	0000.5	0001.0								

2 Update Code: A 80

Card Number 1-4: A06

G Unscheduled Maint		H Turnaround		I Mission Profile Change		J M/H per Hour		K Annual Maint M/H		16-65
Mean Elapsed Time	Mean Man Hrs	Mean Elapsed Time	Mean Man Hrs	Mean Elapsed Time	Mean Man Hrs	Scheduled	Unscheduled	Scheduled	Unscheduled	
0002.0	0004.0					0001.0	0001.0	0004.0	0006.0	

2 Update Code: A 80

INTERMEDIATE/DIRECT SUPPORT MAINTENANCE/AFLOAT

Card Number 1-4: A07
1 Maintenance Requirements 16-21
TASK INTERVAL Record to Tenths of Hours 22-61

A Number of Systems Supported	B Intermediate Insp		C Periodic Insp		D M/H per Hour		E Annual Maint M/H	
	Mean Elapsed Time	Mean Man Hrs	Mean Elapsed Time	Mean Man Hrs	Scheduled	Unscheduled	Scheduled	Unscheduled
000048					0001.0	0005.0	0020.0	0030.0

2 Update Code: 80

INTERMEDIATE/GENERAL SUPPORT MAINTENANCE/ASHORE

Card Number 1-4: A08
1 Maintenance Requirements 16-21
TASK INTERVAL Record to Tenths of Hours 22-41
2 Update Code: A 80

A Number of Systems Supported	B M/H per Hour		C Annual Maint M/H	
	Scheduled	Unscheduled	Scheduled	Unscheduled
000096	0002.0	0004.0	0004.0	0015.0

DEPOT MAINTENANCE

A 09
1 Maintenance Requirements 16-21
TASK INTERVAL Record to Tenths of Hours 22-41
2 Update Code: A 80

A Number of Systems Supported	B M/H per Hour		C Annual Maint M/H	
	Scheduled	Unscheduled	Scheduled	Unscheduled
000019	0004.0	0004.0	0005.0	0020.0

SYSTEM/END ITEM AVAILABILITY

Card Number 1-4: A10
1 Availability Requirements 16-47
2 Update Code: A 80

A MTTR	B MTBF	C Ai	D MAMDT	E MTBMA	F Ao
0002.0	0100.0	.9804	0004.0	0053.0	.9868

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FIGURE B-2. DATA SHEET A

Appendix B--Continued

f. Data Sheet B, Item R & M Characteristics. (1) The R & M characteristics data sheet records four types of data.

(a) Failure data, including failure modes, effects, and frequency.

(b) Maintainability review data.

(c) The maintenance concept of the item under analysis.

(d) The results of applying reliability centered maintenance (RCM) logic to the item under analysis.

(2) The contractor's reliability (R) and maintainability (M) program will normally provide the data for completion of the "B" sheet. With procuring activity approval, the contractor's failure modes and effects analysis documentation may be used in lieu of portions of the "B" sheet. These data may be incorporated as part of the hard copy storage in accordance with paragraph B-3a.

(3) During validation data sheets are prepared to an indenture level sufficient to allocate numerical maintainability parameters. The maintainability considerations are a guide for evaluating design features and are the basis for initial quantitative maintainability prediction. The item's maintenance concept describes the maintenance approach envisioned and establishes a baseline for life-cycle costing and other evaluations of the item.

(4) During full-scale development additional data sheets are completed for lower indenture levels of the system/equipment, to include each reparable item and item of support equipment. The failure data recorded on this data sheet are a substantial starting point for the maintenance task analysis. The failure effects data are the bases for developing fault location and troubleshooting routines. See figure B-3 for sample Data Sheet B.

DATA SHEET B: ITEM RELIABILITY (R) AND MAINTAINABILITY (M) CHARACTERISTICS

PAGE 001

Card Number 1 4 | B 0 1

1 FGC WBS WUC 5 15: 001
2 End Item Acronym Code 16 21: MIAI
3 Service Des Cd 22: A
4 FSCM 23 27: 22255
5 Alternative Action Code 28: A
6 Rev Code 29: B
7 Data Sheet Status 30: N
8 Dwg Class 31 33: A2Y
9 Serial Number Effectivity FROM 300 TO 400 34 53
10 Date 54 59: 7 7 06 15 (YR MO DA)
11 Update Code 80: A

Card Number 1 4 | B 0 2
1 Item Name 16 34: ENGINE GASOLINE
2 Type Model Series 35 60: GA331
3 Conversion Factor 61 64: 01.00
4 Update Code 80: A

Card Number 1 4 | B 0 3 A / B 0 3 B
1 Mfr Part Number 16 31: 3A62944567 LRNC 32
2 FSCM 33 37: 22255
3 Drawing Number 38 53: 3A62944567 LRNC 54
4 FSCM 55 59: 22255
5 Update Code 80: A

Card Number 1 4 | B 0 4
1 MAINTAINABILITY CONSIDERATIONS (A Adequate N Not Adequate)
a. Standardization 16: A
b. Accessibility 17: A
c. Ease of Maintenance 18: A
d. Safety 19: A
e. Test Points 20: A
f. Seals 21: A
g. Training 22: N
h. Connectors for Ease of Removal 23:
i. Standard Packaging & Transportation 24: A
j. Fault Location 25:
k. Labeling & Identification (Elect Wires, etc.) 26: A
l. Design for Self Protection Against Damage After Failure 27:
2 Maintenance Concept Impact (Y Yes, N No)
a. Peculiar Support & Test Equipment 28: N
b. Peculiar Tools 29: N
c. Facilities 30: Y
3 R & M Factors
a. Mean Time Between Failure 31 36: 000100
b. Mean Time to Repair 37 42: 000010
c. Mean Time Between Maintenance Action 43 48: 000500
4 Update Code 80:

FAILURE ANALYSIS

Card Number 1 4 | B 0 5 A / B 0 5 I

a Failure Mode 16 31	b Failure Symptoms 32 47	c Failure Effect and Criticality 48 63	d % of Fail Rate 64 66	e Repair Time 67 71	f Task Code 72 78
CRACKED PISTON	LOW COMPRESSION	OPERATES AT LOW SPEED, NO POWER	000	00000	HGOXXAA
DEFECTIVE IGNIT-ION SYSTEM	RUNS ROUGH, ENGINE BACKFIRES	OPERATES AT REDUCED POWER	035	00005	TEOXXAA

2 Update Code 80: A, A

RELIABILITY CENTERED MAINTENANCE ANALYSIS (APPENDIX C)

Card Number 1 4 | B 0 6 A / B 0 6 I

a Logic Results (Figure C 2) 16 29 Block Number 1A 1B 2A 2B 3 4 5 6 7 8 9 10 11 12	b Disposition 30 33 C M	O C	H T	D R	c Task Analysis Documentation FGC/WBS:WUC 34 44	Task Code 45 51	SLN 52 53
Y N Y N	Y	N			001	AEOXXBA	09
Y Y Y Y	Y	N			001	CEOXXAA	15

2 Update Code 80: A, A

Card Number 1 4 | B 0 7
1 ITEM FUNCTION 16 79: TO PROVIDE MOTIVE POWER FOR VEHICLE AND ELECT/HYD ACCESSORIES
2 Update Code 80: A

Card Number 1 4 | B 0 8
1 QUALITATIVE MAINTAINABILITY REQUIREMENTS (Fail Safe, Environmental, etc.) 16 79
POWER PACK OPERATION IS TO BE SAFEGUARDED BY TRANSMITTERS AND WARNING LIGHT CIRCUITS IN THE OIL AND COOLING SYSTEMS FOR MAJOR COMPONENTS. INCORPORATE OVERSPEED PROTECTION FOR ENGINE
2 Update Code 80: A

Card Number 1 4 | B 0 9
1 MAINTENANCE CONCEPT 16 79
ORG MAINT - INSP, SVC, ADJ, AND REPLACEMENT OF COMPONENTS
DS MAINT - REPLACEMENT, MINOR REPAIRS, COMPONENT REPAIRS
GS MAINT - COMPLETE REPAIR CAPABILITY OF ENGINE AND COMPONENTS
DEPOT - OVERHAUL OF ENGINE AND COMPONENTS
2 Update Code 80: A

Card Number 1 4 | B 1 8
1 REMARKS RECOMMENDATIONS JUSTIFICATION 16 79
MAJOR COMPONENT RELIABILITY IS SUCH THAT ORG MAINT REPAIR CAPABILITY IS NOT WARRANTED. TOE/TA FOR DS AND GS LEVELS CONTAIN CAPABILITY FOR REPAIR OF ENGINE AND COMPONENTS.
2 Update Code 80: A

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FIGURE B-3. DATA SHEET B

g. Data Sheet C, Task Analysis Summary. The Task Analysis Summary data sheet identifies maintenance tasks and interrelates support requirements (e.g., skill specialties, personnel requirements, task times, and support equipment). This data sheet has two functions. First, it provides a sound basis for recommending changes to the configuration, or design approach, when the supportability is marginal or unsatisfactory. Secondly, when the requirement for a particular maintenance function is justified, the data sheet provides the data for planning the logistic support. The data sheet shall be completed down to the indenture level for which the R & M characteristics have been identified (Data Sheet B). When alternate maintenance approaches are identified, a separate task analysis summary is prepared for each approach. During full-scale development, Data Sheet C shall be completed for all significant maintenance tasks required on each reparable item including support and test equipment. See figure B-4 for sample Data Sheet C.

DATA SHEET C: TASK ANALYSIS SUMMARY

For use of this form, see AMCP 750-16.

PAGE

Card Number 1-4: C 0 1

1 FGC/WBS/WUC: 0 0 1

2 End Item Acronym Code 16-21: M 1 5 1 A 1

3 Service Dev Cd: A

4 FSCM 23-27: 2 2 2 6 5

5 Alternative Action Code: A

6 Rev Code: A

7 Data Sheet Status: A

8 Dwg Class 31-33: A 2 Y

9 Serial Number Effectivity FROM: 3 0 0 TO: 4 0 0

10 Data 54-59: 7 6 1 0 2 1 (YR MO DA)

11 Update Code: A

Card Number 1-4: C 0 2

1 Item Name 16-34: ENGINE, GASOLINE

2 Type Model Series 35-60: 0 A 3 3 1

3 Conversion Factor 61-64: 0 1 . 0 0

4 Update Code: A

Card Number 1-4: C 0 3 A / C 0 3 B

1 Mfr Part Number 16-31 LRNC 32: 3 A 6 2 9 4 5 6 7

2 FSCM 33-37: 2 2 2 5 5

3 Drawing Number 38-53 LRNC 54: 3 A 6 2 9 4 5 6 7

4 FSCM 55-59: 2 2 2 5 5

5 Update Code: A

BLOCK 1 TASK CODE COMPONENTS

TASK FUNCTION CODE (1st Digit)

- A Inspect
- B Test
- C Service
- D Adjust
- E Align
- F Calibrate
- G Install
- H Remove/Replace
- J Repair
- K Overhaul
- L Rebuild
- M Mission Profile Change
- N Fault Location
- O Operate
- P Lubricate
- Q Disassemble/Assemble

TASK INTERVAL CODE (2nd Digit)

- A Preoperative/Preflight
- B Scheduled
- C Daily
- D Intermediate Phase Inspection Minor
- E Periodic/Phase Inspection Major
- F Special
- G Unscheduled
- H Post Operative/Post Flight
- J Emergency
- K Normal
- L Weekly
- M Quarterly
- N Semiannually
- P Monthly
- Q Calendar
- R Overhaul Cycle

MAINTENANCE (LEVEL) CODE (3rd, 4th, and 5th Digits)

FIRST SPACE OF MAINT CODE

- C Operator/Crew
- O Organizational
- F Intermediate/Direct Support/Afloat
- H Intermediate/General Support/Ashore
- G Intermediate/Ashore & Afloat (Navy)
- D Depot/Specialized Repair Activity/Shipyards
- X Not Applicable

OPERABILITY CODE (6th Digit)

- A System Inoperable during Equip Maint
- B System Operable during Equip Maint
- T Turnaround
- Y Off Equip Maint

TASK SEQ CODE (7th Digit)

Enter Alpha Numeric Codes (A-Z, 1-9) for All Similar Tasks

	TASK SUMMARY											PERSONNEL SUMMARY													
CARD NO.	1 TASK CODE				2 TASK FREQUENCY (RECORD TO HUNDREDTHS)	3 MEASTASK	4 ELAPSED TIME (REC TO 100THS OF HRS)			5 PROFICIENCY SKILL LEVEL	6 SKILL SPECIALTY CODE	8 SKILL LEVEL	9 NO OF MEN PER TASK	10 MAN-HOURS (REC TO 100THS OF HRS)			11 REMARKS				12
	ARMY	NAVY	AIR FORCE				A ALLOCATED	B PREDICTED	C MEASURED					A ALLOCATED	B PREDICTED	C MEASURED	A TAI	B TRN EQP	C SUPPORT EQUIP GROUPING ID NO	D TOOL CD / UPDATE CODE	
4	16	18	19	20	21-26 / 21-27	28	29-33	34-38	39-43	44	45-52	53	54-55	56-60	61-65	66-70	71	72	73-75	76 / 80	
	C	E	O	X	X	A	A	0 0 2 . 0 0	M	0 0 1 . 7 0	0 0 1 . 5 0		Y	B 6 3 B 2 0		A	0 1	0 0 1 . 7 0	0 0 1 . 5 0		N	N	1 0 0	C A
	H	G	O	X	X	A	A	0 0 0 . 5 0	M	0 0 4 . 5	0 0 0 . 4 0		Y	B 6 3 B 2 0		A	0 2	0 0 9 . 0 0	0 0 8 . 0 0		N	N	2 0 0	C A
	J	G	O	X	X	A	A	0 0 1 . 0 0	M	0 0 0 . 6 5	0 0 0 . 5 0		Y	B 6 3 B 2 0		A	0 1	0 0 0 . 6 5	0 0 0 . 5 0		N	N		C A
	J	G	F	X	X	A	A	0 0 0 . 5 0	M	0 0 2 . 7 5	0 0 3 . 0 0		Y	I 6 3 H 4 0		A	0 1	0 0 2 . 7 5	0 0 3 . 0 0		N	N	3 0 0	C A
	K	R	H	X	X	A	A	0 0 0 . 2 0	M	0 0 9 . 2 0	0 0 8 . 5 0		Y	A 6 3 H 4 0		A	0 2	0 1 . 8 4	0 0 1 . 7 0		Y	N	4 0 0	C A
	L	F	D	X	X	A	A	0 0 0 . 1 0	M	0 0 8 . 0 0	0 0 7 . 0 0		Y	A W G 0 5		A	0 3	0 2 . 4 0	0 0 2 . 1 0		Y	N	4 0 0	C A

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FIGURE B-4. DATA SHEET C

h. Data Sheet D, Maintenance Task Analysis. The Maintenance Task Analysis data sheet is used to describe how each maintenance and operator task is performed in terms of other related logistic support elements. The data:

(1) Explain the tasks entered on the Task Analysis Summary (Data Sheet C).

(2) Provide descriptive information for development of technical publications.

(3) Provide information for developing personnel and training requirements.

(4) Identify support equipment, repair parts, and materiel needed for the maintenance task.

This data sheet shall be completed during the detailed system/equipment design for each maintenance task on all reparable items or subassemblies. See Figure B-5 for sample Data Sheet D.

DATA SHEET D: MAINTENANCE AND OPERATOR TASK ANALYSIS

For use of this form, see AMCP 750-16.

PAGE

Card Number 1-4 D 0 1

1. FGC/WBS/WUC 5-15: 00 1
2. Task Code 16-22: HGCXXAA
3. End Item Acronym Code 23-28: MISIAI
4. Service Dist Cd 29: A
5. FSCM 30-34: 22255
6. Alternative Action Code 35:
7. Rev Code 36: A
8. Data Sheet Status 37: A
9. Drawing Class 38-40: A2Y
10. Serial Number Effectivity FROM 41-60: 300 TO 400
11. Date 61-66: 760325 (YR MO DA)
12. Update Code 80: A

Card Number 1-4 D 0 2

1. Item Name 23-41: ENGINE GASOLINE
2. Type, Model, Series 42-67: 0A331
3. Conversion Factor 68-72: 01.00
4. Update Code 80: A

Card Number 1-4 D 0 3 A / D 0 3 B

1. Mfr Part Number 23-38: 3AG29456 7 LRNC 39:
2. FSCM 40-44: 22255
3. Drawing Number 45-60: 3AG29456 7 LRNC 61:
4. FSCM 62-66: 22255
5. Update Code 80: A

Card Number 1-4 D 0 4

1. Task Identification 23-62: REMOVE AND REPLACE ENGINE
2. Safety Hazard Code 63: 2
3. Update Code 80: A

Card Number 1-4	1. SLN 23-24	2. Sequential Task Description 25-79	3. Update Code 80
D 0 5 A	01	PLACE VEHICLE UNDER SUITABLE LIFTING EQUIPMENT (I.E. ENGINE HOIST)	A
	02	RAISE HOOD AND LOWER LEFT AND RIGHT HOOD SIDE PANELS	A
	03	STARTING AT LEFT SIDE OF ENGINE, CLOSE FUEL LINE SHUTOFF VALVE AND DISCONNECT FUEL LINE	A
	04	LOOSEN BOLT SECURING ENGINE BOND STRAP AND REMOVE STRAP FROM BOLT	A
	05	DISCONNECT IGNITION COIL CABLE FROM IGNITION COIL	A
	06	DISCONNECT TEMPERATURE GAGE CABLE FROM TEMP. SENDING UNIT	A
	07	DISCONNECT GENERATOR-TO-REGULATOR FIELD CABLE FROM GENERATOR FIELD TERMINAL	A
	08	DISCONNECT GENERATOR-TO-REGULATOR ARMATURE CABLE FROM GENERATOR ARMATURE TERMINAL	A
	09	DISCONNECT GROUND CABLE FROM CAPACITOR MOUNTING SCREW	A
	10	REMOVE ENGINE HARNESS ASSY FROM (2) INSULATED CLIPS ON PUSH ROD COVER	A
	11	DISCONNECT CARBURETOR CHOKE CONTROL AT CONTROL LEVER AND CHOKE LEVER BRACKET	A
	12	AT THE FRONT OF THE ENGINE REMOVE (2) NUTS AND BOLTS AT THE BOTTOM OF BRUSH GUARD	A
	13	LOOSEN (2) NUTS AND BOLTS SECURING BRUSH GUARD TO BRUSH-GUARD BRACES AND REMOVE BRUSH GUARD	A
	14	STARTING ON RIGHT SIDE OF ENGINE DISCONNECT CARBURETOR LINK ASSY AT THROTTLE LEVER	A
	15	DISCONNECT CARBURETOR INTAKE HOSE FROM CARBURETOR AND GOVERNOR ASSY	A
	16	DISCONNECT WINDSHIELD WIPER VAQUUM LINE FROM VACUUM RISER TEE	A
D 0 5 Q		CONTINUED ON THE NEXT PAGE	

Card Number 1-4	1. SLN 23-24	2. Work Area 25-28	3. Type Skill 29	4. SSC 30-36	5. Man Hours 37-41	6. Elapsed Time 42-46	7. Update Code 80
D 0 6 A	01	00 1	A	63B20	0001.0	0001.0	A
	02	00 1	A	63B20	0003.0	0003.0	A
	03	00 1	A	63B20	0001.0	0001.0	A
	04	00 1	B	63B20	0004.0	0004.0	A
	05	00 1	B	63B20	0004.0	0004.0	A
	06	00 1	A	63B20	0003.0	0003.0	A
	07	00 1	B	63B20	0005.0	0005.0	A
D 0 6 H	CONTINUED ON NEXT PAGE						

Card No. 1-4	1. Mfr Part Number 23-38	2. Item Sequence Number 39	3. Item Name 40-58	4. Qty per Task 59-63	5. Update Code 80
D 0 7 A	3AG29456 7	Y	ENGINE GASOLINE	0001.0	A
	2145M578	J	ENGINE HOIST	0001.0	A
	5784263 98	K	3/4 INCH WRENCH	0001.0	A
	41299W40	Q	OIL-10W40	0005.0	A
D 0 7 H	CONTINUED ON THE NEXT PAGE				

Card Number 1-4	1. Skill Specialty Codes A 23-29	B 30-36	C 37-43	D 44-50	E 51-57	F 58-64	G 65-71	H 72-78	2. Update Code 80
D 0 8 A	63B20	63B20							A

Card Number 1-4	1. Man Hours 23-27	28-32	33-37	38-42	43-47	48-52	53-57	58-62	2. Total Elapsed Time 63-67	3. Update Code 80
D 0 8 B									0040.0	A

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FIGURE B-5. DATA SHEET D

Appendix B--Continued

i. Data Sheet E Support and Test Equipment or Training Material Description and Justification. This sheet shall be used to describe and justify any support equipment, peculiar tool requirement, and training material which is indicated on Data Sheet C. All Test, Measurement, and Diagnostic Equipment (TMDE) acquisitions require prior approval by the US Army Central TMDE Activity (USACTA) in accordance with AR 750-43. Acquisition requests forwarded to the USACTA include completed DA Forms 4062-R and 4062-1-R; however, materiel developers utilizing the LSAR may substitute the Data Sheet E for the required DA Forms. See figure B-6 for sample Data Sheet E. If the item requested is included in the DA TMDE Register, DA Pamphlet 700-20, Card E07A through E18 need not be completed. If the item requested is included on the DA TMDE Preferred Items List (DA TMDE PIL), DA Pamphlet 700-21-1, the E Sheet need not be completed. The procedure to request acquisition of an item included on the DA TMDE PIL is to initiate a letter which identifies the TMDE item, the system to be supported by the item, the quantity requested, and the unit cost. Any acquisition request, whether initiated by DA Forms 4062-R and 4062-1-R, Data Sheet E, or letter, as discussed above, is to be processed through the appropriate DARCOM major subordinate command in accordance with Chapter 3, AR 750-43. On receipt of a Data Sheet E or a letter requesting acquisition of a TMDE item, the USACTA will review the acquisition request and attach a DA Form 4062-R indicating approval/disapproval. An approved DA Form 4062-R must accompany each procurement package applicable to test equipment.

DATA SHEET E: SUPPORT AND TEST EQUIPMENT OR TRAINING MATERIAL DESCRIPTION AND JUSTIFICATION

PAGE

Card Number 1-4 E01
1. FGC/WBS/WUC 5-15: 0219
2. End Item Acronym Code 16-21: MISIAI
3. Service Des Cd: A (22)
4. FSCM 23-27: 22235
5. Alternative Action Code: A (28)
6. Rec Code: A (29)
7. Data Sheet Status: A (30)
8. Dorg Class 31-33: A2P
9. Serial Number Effectivity FROM: 300 TO: 400 34-53
10. Date 54-59: 7Y 06 12
11. Update Code: A (80)

Card Number 1-4 E02
1. Item Name 16-34: TEST SET RADAR
2. Type, Model, Series 35-60: APM-247
3. Conversion Factor 61-64: 0050
4. Update Code: A (80)

Card Number 1-4 E03A
1. Mfr Part Number 16-31: 9780G-1 (32)
LRNC
2. FSCM 33-37: 13499
3. Drawing Number 38-53: 5222-5731-0151 (54)
LRNC
4. FSCM 55-59: 13499
5. Update Code: A (80)

Card Number 1-4 E03B

Card Number 1-4 E04
1. Type Item Code 16-18: PRD
2. Operating a. Length 19-22: 305
b. Width 23-26: 102
c. Height 27-30: 082
d. Unit Meas 31-32: FT
e. Weight 33-38: 4866
f. Unit Meas 39-40: LB
3. Storage a. Length 41-44: 305
b. Width 45-48: 082
c. Height 49-52: 102
d. Unit Meas 53-54: FT
e. Weight 55-60: 4866
f. Unit Meas 61-62: LB
4. Update Code: A (80)

Card Number 1-4 E05
1. Procurement Concept Code 16: 3
2. Unit Cost a. Non recurring 17-26: 52518.5
UPM: 1 (27)
b. Recurring 28-37: 0000000000
UPM: 1 (38)
3. Total Quantity Rec 39-44: 1
4. Extended Unit Price 45-56: 52518.5
5. Sup Equip Gp ID NO. 57-59: 100
6. Update Code: A (80)

FUNCTIONS TO BE PERFORMED, C & D SHEETS

Card Number 1-4 E06A
1. FGC/WBS/WUC 16-26: 0211
2. Task Code 27-33: CEOXXAA
1. FGC/WBS/WUC 34-44: 00103
2. Task Code 45-51: HOBXXAA
1. FGC/WBS/WUC 52-62: 00104
2. Task Code 63-69: JGBXXAA
3. Update Code: A (80)

Card Number 1-4 E06B
1. FGC/WBS/WUC 16-26: 00106B03
2. Task Code 27-33: KRHXXAA
1. FGC/WBS/WUC 34-44: 00109407
2. Task Code 45-51: LFOXXAA
3. Update Code: A

TEST MEASUREMENT AND DIAGNOSTIC EQUIPMENT

Card Number 1-4 E07A
1. Parameters Measured 16-27: VOLTS
2. Range (From) 28-35: 00000
3. Units: O (36)
4. Range (To) 37-44: 150000
5. Units: H (46)
6. % Accuracy 48-50: 100
7. No. Of Ranges 51-53: N/A
8. Update Code: A

Card Number 1-4 E07B
AMPS
2. Range (From): 00000
3. Units: O
4. Range (To): 1000000
5. Units: V
6. % Accuracy: 100
7. No. Of Ranges: 2
8. Update Code: A

Card Number 1-4 E07C
2. Range (From): 30000
3. Units: H
4. Range (To): 40200
5. Units: H
6. % Accuracy: 5.00
7. No. Of Ranges: N/A
8. Update Code: A

Card Number 1-4 E07D

Card Number 1-4 E07E

Card Number 1-4 E08
1. JUSTIFICATION 16-79: TASK REQUIREMENTS: THIS TEST SET IS REQUIRED TO PERFORM THE TESTS TO VARIFY PERFORMANCE OF THE AN/APN-158 WHICH IS A SUB SYSTEM OF THE MISIAI. NO COMMERCIALLY AVAILABLE ITEM CAN PERFORM THE NECESSARY TESTING. THE OQ-63/APS-240 CANNOT BE USED BECAUSE THE BUILT IN POWER SUPPLIES ARE NOT HEAVY ENOUGH.
2. Update Code: A (80)

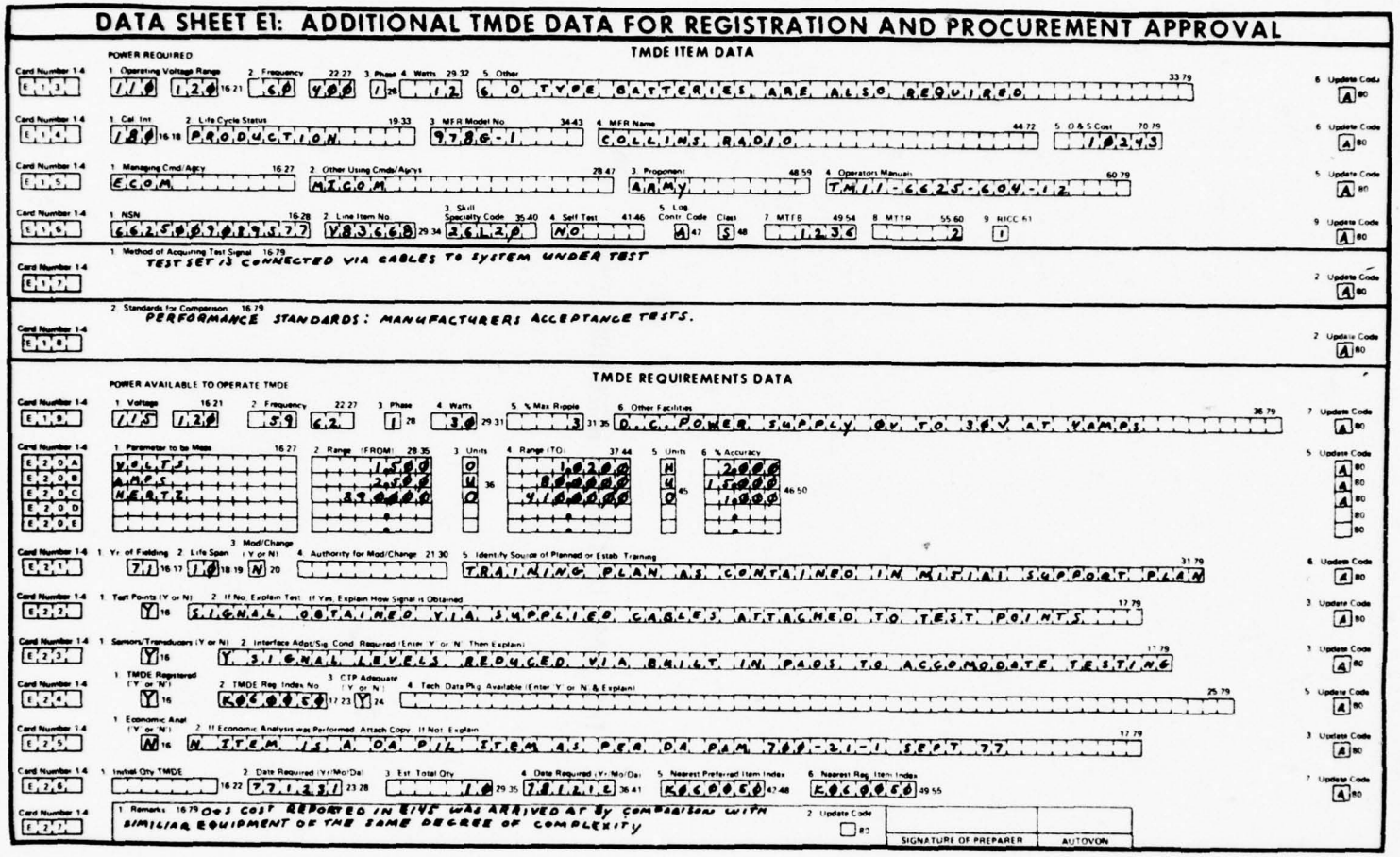
Card Number 1-4 E09
1. DESCRIPTION OF OPERATION/FUNCTION 16-79: STANDARD SIGNALS PROVIDED BY THE TEST SET WILL BE USED IN CONJUNCTION WITH ANCILLARY TEST EQUIPMENT TO ISOLATE TROUBLE WITHIN THE INDICATOR GROUP TO A CIRCUIT BOARD OR SUBASSEMBLY
2. Update Code: A (80)

Card Number 1-4 E10
1. CHARACTERISTICS/NARRATIVE DESCRIPTION 16-79: THE AN/APM-247 CONTAINS THE INTERCONNECTION WIRING AND TEST CIRCUITS FOR OPERATING, TESTING, ADJUSTING AND TROUBLESHOOTING THE AN/APN-158 ON THE BENCH. SWITCHING CIRCUITS ARE INCLUDED TO FACILITATE MEASURING THE PERFORMANCE OF RADAR CIRCUITRY.
2. Update Code: A (80)

Card Number 1-4 E11
1. ADDITIONAL SKILL, SPECIAL TRAINING REQUIREMENTS 16-79: REPAIRMAN MUST, IN ADDITION TO STANDARD ARMY TRAINING, ATTEND A CONTRACTOR COURSE OF INSTRUCTION.
2. Update Code: A (80)

Card Number 1-4 E12
1. INSTALLATION FACTORS 16-79: TEST SET CANNOT BE USED ABOVE 10,000 FT or AT TEMPERATURES BELOW -30 DEGREES C or +120 Degrees C.
2. Update Code: A (80)

FIGURE B-6, DATA SHEET E



DATA SHEET E1: ADDITIONAL TMDE DATA FOR REGISTRATION AND PROCUREMENT APPROVAL

POWER REQUIRED — TMDE ITEM DATA

E103: 1 Operating Voltage Range: 110 120 | 2 Frequency: 60 | 3 Phase: 1 | 4 Watts: 12 | 5 Other: 6.0 TYPE BATTERIES ARE ALSO REQUIRED

E104: 1 Cal Int: 180 | 2 Life Cycle Status: PRODUCTION | 3 MFR Model No: 978G-1 | 4 MFR Name: COLLINS RADIO | 5 O & S Cost: 10345

E105: 1 Managing Cmd/Agcy: ECOM | 2 Other Using Cmds/Agcys: MICOM | 3 Proponent: ARMY | 4 Operators Manual: TM11-6625-609V-12

E106: 1 NSN: 6625-00-989-5777 | 2 Line Item No: V83668 | 3 Skill Specialty Code: 261A0 | 4 Self Test: NO | 5 Log Contr Code: A | Class: S | 7 MTBF: 1236 | 8 MTTR: 2 | 9 RICC: 1

E107: 1 Method of Acquiring Test Signal: TEST SET IS CONNECTED VIA CABLES TO SYSTEM UNDER TEST

E108: 2 Standards for Comparison: PERFORMANCE STANDARDS: MANUFACTURERS ACCEPTANCE TESTS.

TMDE REQUIREMENTS DATA

POWER AVAILABLE TO OPERATE TMDE

E109: 1 Voltage: 115 | 2 Frequency: 59 62 | 3 Phase: 1 | 4 Watts: 30 | 5 % Max Ripple: 3 | 6 Other Facilities: D.C. POWER SUPPLY 0V TO 30V AT 4AMPS

E20A: 1 Parameter to be Meas: VOLTS | 2 Range (FROM): 1500 | 3 Units: 0 | 4 Range (TO): 1020 | 5 Units: N | 6 % Accuracy: 2000

E20B: AMPS | 2500 | 0 | 8000 | U | 1500

E20C: MEGS, TZ | 89000 | 0 | 41000 | O | 1000

E20D:

E20E:

E231: 1 Yr of Fielding: 77 | 2 Life Span: 10 | 3 Mod/Change (Y or N): N | 4 Authority for Mod/Change: | 5 Identify Source of Planned or Estab Training: TRAINING PLAN AS CONTAINED IN MITAI SUPPORT PLAN

E232: 1 Test Points (Y or N): Y | 2 If No, Explain Test. If Yes, Explain How Signal is Obtained: SIGNAL OBTAINED VIA SUPPLIED CABLES ATTACHED TO TEST POINTS

E233: 1 Sensors/Transducers (Y or N): Y | 2 Interface Adpt/Sig Cond Required (Enter Y or N. Then Explain): Y. SIGNAL LEVELS REDUCED VIA BUILT IN PADS TO ACCOMODATE TESTING

E234: 1 TMDE Registered (Y or N): Y | 2 TMDE Reg Index No: K06065 | 3 CTP Adequate (Y or N): Y | 4 Tech Data Pkg Available (Enter Y or N. & Explain):

E235: 1 Economic Anal (Y or N): N | 2 If Economic Analysis was Performed Attach Copy. If Not Explain: N. ITEM IS A DA P/L ITEM AS PER DA PAM 700-21-1 SEPT 77

E236: 1 Initial Qty TMDE: | 2 Date Required (Yr/Mo/Da): 77123 | 3 Est Total Qty: 10 | 4 Date Required (Yr/Mo/Da): 781215 | 5 Nearest Preferred Item Index: K06065 | 6 Nearest Reg Item Index: K06065

E237: 1 Remarks: O&S COST REPORTED IN E1VE WAS ARRIVED AT BY COMPARISON WITH SIMILAR EQUIPMENT OF THE SAME DEGREE OF COMPLEXITY | 2 Update Code | SIGNATURE OF PREPARER | AUTOVON

B-16.1

FIGURE B-6A, DATA SHEET E1

DAPPOM 73-16, Page 73-16

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Appendix B--Continued

j. Data Sheet F, Facility Description and Justification. This data sheet shall be used to describe and justify all proposed special or additional facility requirements which are indicated on Data Sheet C. Sketches or other information may be incorporated as part of the hardcopy storage in accordance with para B-3a. These data are required to provide facility designers with the technical information necessary to prepare facility plans. See Figure B-7 for sample Data Sheet F.

DATA SHEET F: FACILITY DESCRIPTION AND JUSTIFICATION

For use of this form, see AMCP 750-16.

PAGE

Card Number 1-4: P001

1. FGC/WBS/WUC (Facility) 5-15: 075
2. End Item Acronym Code 16-21: MISTAT
3. Service Des Cd 22: A
4. FSCM 23-27: 22255
5. Alternative Action Code 28: A
6. Rec Code 29: A
7. Data Sheet Status 30: A
8. Drg Class 31-33: A2F
9. Item Name (Facility) 34-52: ENG DYNAMIC TESTER
10. Date 53-58: 73 11 04 (YR MO DA)
11. Facility Cat Code 59-64:
12. Update Code 80: A

FUNCTIONS TO BE PERFORMED, C & D SHEETS

Card Number 1-4: P002A

1. FGC/WBS/WUC 16-26: 001
2. Task Code 27-33: LFDXXAA
1. FGC/WBS/WUC 34-44: 001
2. Task Code 45-51: KRDXXAA
1. FGC/WBS/WUC 52-62:
2. Task Code 63-69:
3. Update Code 80: A

Card Number 1-4: P002B

1. FGC/WBS/WUC 16-26:
2. Task Code 27-33:
1. FGC/WBS/WUC 34-44:
2. Task Code 45-51:
1. FGC/WBS/WUC 52-62:
2. Task Code 63-69:
3. Update Code 80:

Card Number 1-4: P003

1. FACILITIES REQUIREMENTS 16-79: TO PERFORM DYNAMIC TEST OF RETURNED ENGINES PRIOR TO AND SUBSEQUENT TO DEPOT OVERHAUL REQUIRES TEST FACILITIES WITH COMPLETE AUTOMATIC TEST EQUIPMENT TO SIMULATE FULL OPERATING RANGE. FACILITIES REQUIRED AT TWO DEPOTS, LOCATED WITHIN CURRENT DEPOT HEAVY ENGINE OVERHAUL AREA.
2. Update Code 80: A

Card Number 1-4: P004

1. FACILITIES DESIGN CRITERIA 16-79: TEST FACILITY WILL HAVE FOUR TEST BLOCKS FOR ENGINES. BLOCKS LOCATED FOR INDEPENDENT USE, OVERHEAD MONORAIL SERVICE TO TEST BLOCK FROM RECEIVING POINT, TEST STAND TO SERVICE AREA, AND TO CONTAMINATION POINT. TEST BLOCKS ENCLOSED WITH NOISE REDUCTION BARRIERS. ENGINE EXHAUST TO OUTSIDE AIR. EXHAUST REPLACED BY OUTSIDE AIR, HEATED IN WINTER. ELECTRICAL SERVICE FOR AUTOMATED TEST EQUIPMENT.
2. Update Code 80: A

Card Number 1-4: P005

1. FACILITIES INSTALLATION LEADTIMES 16-79: TEST FACILITY TO BE OPERATIONAL AT ONE DEPOT 90 DAYS AFTER DELIVERY OF FIRST PRODUCTION EQUIPMENT. SECOND FACILITY TO BE OPERATIONAL 180 DAYS AFTER DELIVERY OF FIRST PRODUCTION EQUIPMENT.
2. Update Code 80: A

Card Number 1-4: P006

1. TYPE OF CONSTRUCTION 16-79: TEST BLOCKS WILL BE DESIGNED TO SECURE ENGINES AT 100% OVERSPEED RUN-AWAY. TEST BLOCKS WILL BE INDIVIDUALLY SHIELDED WITH 8 INCH REINFORCED CONTINUOUS CONCRETE BARRIER, WALLS 6 FEET FROM BLOCK CENTER TO A HEIGHT 2 FEET ABOVE ENGINE WHEN SECURED TO TEST BLOCKS. EGRESS FROM TEST STANDS BY LADDER TO TOP OF BARRIER WALL.
2. Update Code 80: A

Card Number 1-4: P007

1. UTILITIES REQUIREMENTS 16-79: THE TEST FACILITY WILL BE PROVIDED WITH 60 HZ, 120 V POWER TO EACH AUTOMATIC TEST EQUIPMENT STATION. DIRECT OVERHEAD LIGHTING FOR EACH TEST CELL. COMPRESSED AIR OUTLET ON EACH BARRIER SIDEWALL. SEWAGE DRAIN IN BOTTOM OF TEST CELL TO EXISTING CONTAMINATED WATER TREATMENT FACILITY.
2. Update Code 80: A

Card Number 1-4: P008

1. FACILITY UTILIZATION 16-79: EACH TEST FACILITY WILL TEST 1040 ENGINES PRIOR TO AND AFTER OVERHAUL PER YEAR. INCLUDES MINOR IN TEST ADJUSTMENTS REQUIRED FROM AUTOMATED TEST EQUIPMENT READ OUTS.
2. Update Code 80: A

STANDARD FACILITIES PLAN(S) OR SINGLE LINE SKETCH(ES):

Card Number 1-4: P009

1. FACILITY UNIT COST RATIONALE 16-79: THE UNIT COST FOR CONSTRUCTION OF THE FOUR CELL ENGINE TEST CENTER IS ESTIMATED TO BE $100,000. THE EQUIPPING OF THE TEST CENTER WITH FOUR AN/MXX-SX ENGINE TEST SETS WITH TEST HARNESS AND ASSOCIATED TEST PROGRAM SOFTWARE WILL COST AN ESTIMATED $50,000 FOR THE CENTER.
2. Update Code 80: A

Card Number 1-4: P010

1. JUSTIFICATION 16-79: DYNAMIC TESTING OF ENGINES PRIOR TO DEPOT OVERHAUL HAS BEEN SHOWN BY COST AVOIDANCE ON SIMILAR ENGINE OF THE M99AI TO REDUCE AVERAGE OVERHAUL COSTS $1,000 PER ENGINE. WITH THIS SAVING THE BASIC COST OF THE TEST CENTER WILL BE RECOVERED WITHIN THREE YEARS AT ANTICIPATED USE OF 1040 ENGINES PER YEAR.
2. Update Code 80: A

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FIGURE B-7. DATA SHEET F

k. Data Sheet G, Skill Evaluation and Justification. This data sheet describes and justifies any new or modified personnel skill required to support the system/equipment. These data shall be required for each task on Data Sheet C where it is indicated in the skill evaluation block that the skill must be modified or a new skill must be developed. See Figure B-8 for sample Data Sheet G.

DATA SHEET G: SKILL EVALUATION AND JUSTIFICATION

For use of this form, see AMCP 750-16.

PAGE

Card Number 1-4: G01

1. FGC/WBS/WUC 5-15: 0.0.1

2. End Item Acronym Code 16-21: M1S1A1

3. Service Des Cd 22: A

4. FSCM 23-27: 22255

5. Alternative Action Code 28: A

6. Rev Code 29:

7. Data Sheet Status 30:

8. Dmg Class 31-33:

9. Serial Number Effectivity FROM TO 34-53:

10. Date 54-59: 73M04 (YR MO DA)

11. Update Code 80: A

Card Number 1-4: G02

1. Duty Position Requiring a New or Revised Skill 16-34: AUTOMOTIVE REPAIRMN

2. SSC Number Assigned New Duty Position 35-41: 63H30Z

3. Update Code 80: A

Card Number 1-4: G03

SKILL SPECIALTY CODES

1. (Skill Specialty From Which Personnel Can Be Obtained) 16-22: 63H30

23-29: 63H30

2. Aptitude/Qual Test Score 30-31: 50

3. Security Clearance Code 32: S

4. Recommended Rank Rate/Grade 33-35: Military Rank/Rate E05

36-39: Civilian Grade

5. Update Code 80: A

FUNCTIONS TO BE PERFORMED, C & D SHEETS

Card Number 1-4: G04A

1. FGC/WBS/WUC 16-26: 0.0.1

2. Task Code 27-33: KRHXXAA

1. FGC/WBS/WUC 34-44: 0.0.1

2. Task Code 45-51: KFDXXAA

1. FGC/WBS/WUC 52-62:

2. Task Code 63-69:

3. Update Code 80: A

Card Number 1-4: G04B

3. Update Code 80:

Card Number 1-4: G05

1. ADDITIONAL SKILL REQUIREMENTS (SKILL REQUIRING A NEW OR REVISED SKILL CODE) 16-79: THE REQUIREMENT TO DYNAMICALLY TEST ENGINES PRIOR TO AND SUBSEQUENT TO OVERHAUL USING THE AN/MIX-5X ENGINE TEST SET NECESSITATES THAT SKILL REQUIREMENT FOR AUTOMOTIVE MECHANIC, MOS 63H30 BE MODIFIED TO INCLUDE SKILL IN OPERATION OF AUTOMATED TEST EQUIPMENT AND INTERPRETATION OF TEST RESULTS INCLUDING PREPARATION OF WORK STATEMENT TO CORRECT DEFICIENCIES FROM TEST.

2. Update Code 80: A

Card Number 1-4: G06

1. PHYSICAL AND MENTAL REQUIREMENTS 16-79: MODIFICATION REQUIRES KNOWLEDGE OF SPECIALIZED USE ADPS. KNOWLEDGE WILL INCLUDE OPERATION, OPERATOR CHECK PRIOR USE. CHECK OF INPUT AND OUTPUT DATA TO DETERMINE PROPER OPERATION OF TEST SET. TRANSLATE OUTPUT TO WORK REQUIREMENTS FOR ENGINE REPAIR.

2. Update Code 80: A

Card Number 1-4: G07

1. EDUCATIONAL QUALIFICATIONS (ACADEMIC SUBJECTS, SPECIALIZED SUBJECTS, SPECIALIZED DEGREE AND LICENSES, ETC.) 16-79: THE PERSONS SELECTED FOR MODIFICATION OF SPECIALTY SKILLS WILL HAVE EXCEPTIONAL KNOWLEDGE OF MANUAL TEST EQUIPMENT USE AND INTERPRETATION OF TEST EQUIPMENT OUTPUT WITH APTITUDE FOR CLEAR CONCISE WRITTEN COMMUNICATION OF RESULTS.

2. Update Code 80: A

Card Number 1-4: G08

1. JUSTIFICATION 16-79: THE MODIFICATION OF THE AUTOMOTIVE MECHANIC MOS 63H30 TO INCLUDE OPERATION OF AUTOMATED TEST EQUIPMENT UTILIZES THE EXPERIENCE OF THE MECHANIC IN INTERPRETATION OF OUTPUT TO WORK REQUIREMENTS. THIS MODIFICATION PREFERRED TO MODIFICATION OF ADPS MACHINE OPERATIONS SPECIALIST (MOS 74D) TO INTERPRETATION OF OUTPUT, OR ADDITION OF MOS 74D TO MAINTENANCE SHOP TOE.

2. Update Code 80: A

Card Number 1-4: G09

1. ADDITIONAL TRAINING REQUIREMENTS 16-79: THE EXPERIENCED MECHANIC WILL REQUIRE A 3 WK. GEN. ADPS ORIENTATION COURSE AT FT. BEN HARRISON. THE INITIAL OPER. CREW (6 MECHANICS EACH) FOR EACH TEST CENTER WILL RECEIVE 6 HRS. SPEC. HANDS ON INSTRUCTION BY CONTRACTOR REPRESENTATIVE AT LEAD DEPOT WITH OPER. TEST EQ. AND TEST ENGINE TO WHICH FAILURES CAN BE INDUCED. REPLACEMENT CREWS WILL RECEIVE ADPS ORIENTATION, FOLLOWED BY CLOSELY MONITORED ON-THE-JOB TRAINING BY EXPERIENCED OPERATOR. THIS TRAINING AT PES OR SELECTED SITE FROM PROGRAMMED OPERATOR INSTRUCTION PACKAGE PREPARED BY CONTRACTOR.

2. Update Code 80: A

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FIGURE B-8. DATA SHEET G

Appendix B--Continued

1. Data Sheet H, Supply Support Requirements. This data sheet identifies supply support required for operation and maintenance. An H Data Sheet shall be prepared for each item in the system/equipment subject to provisioning actions, to include:

(1) Nonreparable piece-parts and assemblies.

(2) Bulk items.

(3) Reparable end items, components, and assemblies (including Government-furnished property if requested by the procuring activity).

(4) Support equipment, tools, training material, and the resources required for their support.

The H Data Sheet is structured to permit entry of descriptive information for the item on cards HØ1 through HØ4. HØ5 through H2Ø cards will be prepared for each application of the item in the system/equipment. See Figure B-9 for sample Data Sheet H. Figure B-10 illustrates a computer generated "H" sheet. This computer generated "H" sheet is produced by an available ADP program that converts data entered on the H data sheet format contained in AMCP750-16 dated June 1975 into the H data sheet format shown in Figure B-9. This ADP program is to facilitate the conversion of data to the new format with a minimum of manual effort.

Appendix B--Continued

DATA SHEET H: SUPPLY SUPPORT REQUIREMENTS

PCCN: A64697

Card Number 1-4: H 0 1 A
- 1 Manufacturer's Part Number (5-20): 3A6294567
- 2 RNCC (21): 1
- 3 RNFC (22): 3
- 4 FSCM (23-27): 22255
- 5 Item Name (28-46): ENGINE, GASOLINE
- 6 ICC (47): Y
- 7 Qty/EI (48-52): 00001
- 8 Type of Item (53-55): CB
- 9 EC (56): 1
- 10 SL (57): 4
- 11 PLT (58-59): 06
- 12 UM (60-61): EA
- 13 Total Qty Rec (62-67): 000400
- 14 Update Code (80): A

Card Number 1-4: H 0 1 B
- 15 Mfr Part Number Overflow (21-36):
- 16 SCC (37):
- 17 Length (38-41): 0132
- 18 Width (42-45): 0064
- 19 Height (46-49): 0030
- 20 UM (50-51): IN
- 21 Weight (52-57): 000528
- 22 UM (58-59): LB
- 23 PCK (60): U
- 24 Update Code (80): A

Card Number 1-4: H 0 2 A / H 0 2 B / H 0 2 C

25 Additional Reference Numbers (21-52)	26 RNCC (53)	27 RNFC (54)	28 FSCM (55-59)	33 Update Code (80)
3A6294567-01	G	3	22555	A
47B265 3A629	7	3	22555	A
4A6294568	5	3	36829	A

- 29 MAOT (60-63): 20MH
- 30 MAC (64): R
- 31 Unit Price (65-74): 0000370800
- 32 QUP (75-77): 001

Card Number 1-4: H 0 3
- 34 National Stock Number (21-40): 2350001794825
- 35 PSPC (41): U
- 36 SHC (42):
- 37 PPC (43): P
- 38 PCI (44):
- 39 CON TAT (45-47): 045
- 40 TAT (REP CYCLE) ORG / DSU / GSU / DEP (48-59): 002010008060
- 41 REPL TASK DIST ORG / DSU / GSU / PCS / DEP (60-74): 080010000000010
- 42 ACMA (75-77):
- 43 Update Code (80): A

Card Number 1-4: H 0 4 A / H 0 4 B / H 0 4 C
- 44 Basis of Issue (21-35): QUANTITY | BOI END ITEM | LVL | CTL
- 45 Basis of Issue (36-50): QUANTITY | BOI END ITEM | LVL | CTL
- 46 Basis of Issue (51-65): QUANTITY | BOI END ITEM | LVL | CTL
- 47 BIC (66):
- 48 BHL Qty (67-69):
- 49 Update Code (80):

Card Number 1-4: H 0 5
- 50 LSA Control No (21-31): 001
- 51 SMR (32-37): PAOHZ
- 52 Failure Factor I (38-43): 000050
- 53 Failure Factor II (44-49): 000060
- 54 Failure Factor III (50-55): 22233W
- 55 Ind Cd (56): B
- 56 Qty/Assy (57-60): 0001
- 57 Remarks (61-72):
- 58 Update Code (80): A

Card Number 1-4: H 0 6
- 59 PLISN (32-37): AFMA
- 60 NHA PLISN (38-43): AAGK
- 61 Same as PLISN (44-49):
- 62 Prior Item PLISN (50-55): AAAC
- 63 Maint Task Dist ORG / DSU / GSU / DEP / R/R (56-65): 1520205302
- 64 Update Code (80): A

Card Number 1-4: H 0 7 A / H 0 7 B
- 65 DHL/KIT/SET PLISN (32-37): AAHA
- 66 DHL Qty (38-40): 001
- 67 Reference Designation (41-72):
- 68 LRNC (73):
- 69 RDC (74):
- 70 Update Code (80): A

Card Number 1-4: H 0 8 A
- 71 Usable on Codes (32-79): PAA, PAC, PAB, PDC
- 72 Update Code (80): A

Card Number 1-4: H 0 9 A / H 0 9 B / H 0 9 C

73 TM Designation (32-51)	74 TM Chg (52-53)	75 TM Ind Cd (54)	76 Figure No. (55-58)	77 Item No. (59-62)	78 TM FGC (63-73)	79 Update Code (80)
TM9-2320-215-20P		1	0004	0001	01	A
TM9-2320-215-34P		1	0010	0001		A

Card Number 1-4: H 1 0 A / H 1 0 B / H 1 0 C
- 80 Change Authority Number (32-46):
- 81 IC (47-48):
- 82 Serial Number Effectivity FROM / TO (49-66):
- 83 PCC (68-71):
- 84 TIC (72-73):
- 85 Rep or Sup PLISN (74-79):
- 86 Update Code (80):

Card Number 1-4: H 2 0 A / H 2 0 B / H 2 0 C
- 87 Change Authority Number (32-46):
- 88 Qty Shipped (47-52):
- 89 Qty Procured (53-58):
- 90 Update Code (80):

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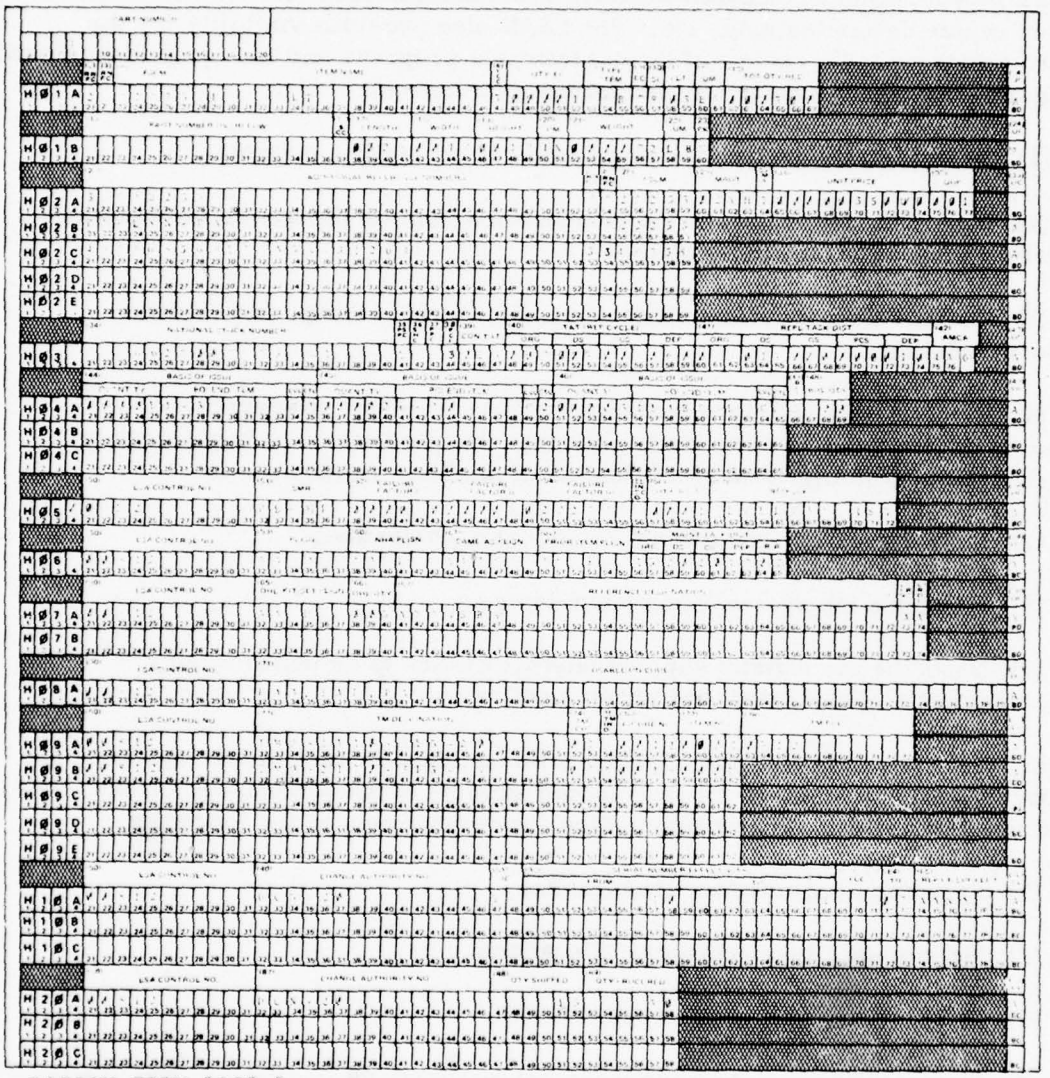
FIGURE B-9. DATA SHEET H

Appendix B--Continued

DATA SHEET H: SUPPLY SUPPORT REQUIREMENTS



DARCOM FORM 1962-1

FIGURE B-10. PRINTER H SHEET

4. Data Utilization. a. The LSAR shall be used as the data source for developing the many documents which define and allocate logistic support resources. Proper utilization of the LSAR will ensure that logistic support documents pertaining to supply support, support equipment, personnel and training, facilities, etc., are compatible with other documents which provide maintenance instructions, skills, level of repair determinations, etc. The LSAR also provides visibility for the Government's periodic review of the contractor's progress and the early identification of logistic problems. The LSAR data form a data base to:

(1) Determine the impact of design features on logistic support.

(2) Determine the impact of the maintenance plan on the system/equipment availability and maintainability goals.

(3) Provide data for trade-off studies, life-cycle costing, and logistic support modeling.

(4) Provide data and documentation for provisioning, preparation of technical publications, maintenance planning, support resource requirements and allocation, training, and identification of facilities requirements.

(5) Exchange valid data among functional organizations.

(6) Influence the system/equipment design.

(7) Describe the logistic support characteristics to be tested during development and operational and other testing.

b. The end product of the LSA and LSAR is identification of the logistic support resources required for operational support of the system/equipment. The LSAR shall be used as source information for development of the following:

(1) Personnel requirements information.

(2) Maintenance level/category allocations.

(3) Provisioning technical documentation.

(4) Operator and maintenance technical publications.

(5) Repair parts and tool lists.

(6) Identification, description, and justification of:

Appendix B--Continued

(a) Test, measurement, and diagnostic equipment.

(b) Peculiar tools and support equipment.

(c) Facilities information.

(d) Training aids and devices.

c. The standard Government ADP programs will produce the summary reports shown in figures B-11 through B-42 on an individual basis, from computer stored data. This capability permits daily visibility of the status of the analysis effort and the LSAR.

d. Contents of the LSAR output summaries are:

(1) LSA-01, Direct Annual Maintenance Man-Hours by Skill Specialty Code and Category of Maintenance. A summary of annual man-hour expenditures by maintenance level and Skill Speciality Code (SSC). Man-hour totals are based on the number of systems supported by category of maintenance. The number of maintenance tasks used to develop the summary is displayed along with the percentage of tasks containing measured man-hours, predicted man-hours, and allocated man-hours. The summary can be used to determine manpower requirements generated by the system/equipment. Format contained at Figure B-11.

(2) LSA-02, Personnel and Skill Summary. A summary of the man-hours, by Skill Specialty Code, expended on each maintenance task. An evaluation of the skill specialty and the requirement for training equipment is provided for each task code. The summary provides annual man-hours per item per maintenance task and total man-hours per maintenance task based on number of systems supported. The summary can be used to determine the time required and number of men, by SSC, to perform each task. Format contained at Figure B-12.

(3) LSA-03, Reliability and Maintenance Summary. Part 1 of the four-part summary compares the current status of the system reliability and maintenance parameters with the requirements recorded on Data Sheet A. Part 2 lists the high 10 unscheduled maintenance tasks by annual maintenance man-hours (AMMH). Part 3 lists the high 10 unscheduled maintenance tasks by task frequency and part 4 lists the high 10 scheduled maintenance tasks by AMMH. The summary can help pinpoint problem areas. Format contained at Figure B-13.

(4) LSA-04, Maintenance Allocation Summary. A summary of the task allocations by maintenance functions and level. The summary is used in writing maintenance publications. Format contained at Figure B-14.

LSA-01 LOGISTIC SUPPORT ANALYSIS RECORD DATE 11/10/76 PAGE 1

DIRECT ANNUAL MAINTENANCE MAN-HOURS BY SKILL SPECIALTY CODE AND LEVEL OF MAINTENANCE

END ITEM ACRONYM	LSA CONTROL NUMBER	MFR PART NUMBER	FSCM	ITEM NAME	SERVICE DESIGNATION
TESTDA	1	XM-1234	X1234	WEAPON SYSTEM	ARMY

SKILL SPECIALTY CODE	OPERATOR/ CREW	ORGANIZATIONAL AVUM	INTERMEDIATE DIRECT SUPPORT AVIM/AFLOAT	INTERMEDIATE GENERAL SUPPORT ASHORE	INTERMEDIATE ASHORE AND AFLOAT (NAVY)	DEPOT/SHIPYARDS SPECIALIZED REPAIR ACTIVITY
WG05	.0000	.0000	.0000	.0000	.0000	7.5000
WG06	.0000	.0000	.0000	.0000	.0000	2.5000
WG07	.0000	.0000	.0000	.0000	.0000	1.0000
11B20	40.5000	.5000	.0000	.0000	.0000	.0000
35A20	.0000	3.1250	.0000	.0000	.0000	.0000
35A30	.0000	.0000	.6500	.0000	.0000	.0000
35A40	.0000	.0000	.0000	2.9750	.0000	.0000
63C20	.0000	77.6000	.0000	.0000	.0000	.0000
63C30	.0000	.0000	1.5500	.0000	.0000	.0000
63C40	.0000	.0000	.0000	1.0750	.0000	.0000
63X30	.0000	.0000	.7500	.0000	.0000	.0000
67A30	.0000	3.0000	3.5100	.0000	.0000	.0000
67A40	.0000	.0000	.0000	10.9500	.0000	.0000

NUMBER OF SYSTEMS SUPPORTED BY MAINTENANCE LEVEL:

OPERATOR/CREW - 1

ORGANIZATIONAL/AVUM - 1

INTERMEDIATE/D.S./AVIM/AFLOAT - 1

INTERMEDIATE/G.S./ASHORE - 1

INTERMEDIATE/ASHORE AND AFLOAT (NAVY) - 1

DEPOT/SHIPYARDS/SPECIALIZED REPAIR ACTIVITY - 1

TOTAL NUMBER OF MAINTENANCE TASKS = 66

NUMBER OF TASKS WITH MEASURED MAN-HOURS = 22 33.3%

NUMBER OF TASKS WITH PREDICTED MAN-HOURS = 44 66.7%

NUMBER OF TASKS WITH ALLOCATED MAN-HOURS = 0 .0%

FIGURE B-11. LSA-01 SUMMARY

LSA-02 LOGISTIC SUPPORT ANALYSIS RECORD DATE 11/10/76 PAGE 3

PERSONNEL AND SKILL SUMMARY

END ITEM ACRONYM	LSA CONTROL NUMBER	MFR PART NUMBER	FSCM	ITEM NAME	SERVICE DESIGNATION
TESTDA	1	XM-1234	X1234	WEAPON SYSTEM	ARMY

OPTIONS EMPLOYED: 1. SKILL SPECIALTY EVALUATION SELECTED - ALL SKILLS

2. NUMBER OF SYSTEMS SUPPORTED BY MAINTENANCE LEVEL:
OPERATOR/CREW - 1
ORGANIZATIONAL/AVUM - 1
INTERMEDIATE/D.S./AVIM/AFLOAT - 1
INTERMEDIATE/G.S./ASHORE - 1
INTERMEDIATE/ASHORE AND AFLOAT (NAVY) - 1
DEPOT/SHIPYARDS/SPECIALIZED REPAIR ACTIVITY - 1

SKILL SPECIALTY CODE	LSA CONTROL NUMBER / ITEM NAME	TASK CODE	TASK IDENTIFICATION	TASK FREQ	SKILL SPEC EVAL	NUM OF MEN	TRNG EQUP REQD	MAN-HRS PER TASK	MHS TYPE CODE	ANNUAL MAN-HRS PER ITEM	TOTAL ANNUAL MAN-HRS
35A40	1022021 BOARD-11	HGHDDYA	REMOVE AND REPLACE CIRCUIT BOARD-11	1.00	E	1		.20	P	.2000	.2000
	1022022	HGHDDYA	REMOVE AND REPLACE CIRCUIT BOARD-2,MN AM	.50	E	1		.30	P	.1500	.1500
		BGHDDYA	TEST CIRCUIT BOARD-2	.50	E	1		.10	M	.0500	.0500
		JGHDDYA	REPAIR CIRCUIT BOARD -2	.40	E	1	Y	1.25	M	.5000	.5000
	102203	JGHDDYB	REPAIR RACK-2,REMOVE /REPLACE CARD-2	.25	E	1	Y	.80	P	.2000	.2000
		JGHDDYA	REPAIR RACK-2, REMOVE/REPLACE CARD-1	.25	E	1	Y	.80	P	.2000	.2000
63C20	1 WEAPON SYSTEM	MGOFFAA	END ITEM MISSION PROFILE CHANGE	1.00	A	2		3.00	M	3.0000	3.0000
		AEOFFBA	PERIODIC END ITEM INSPECTION	4.00	A	2		4.00	P	16.0000	16.0000
	101	JGOFFAA	REMOVE AND REPLACE LEAKY GASKET	1.00	M	2		1.00	M	1.0000	1.0000

FIGURE B-12. LSA-02 SUMMARY

Appendix B--Continued

LSA-03 LOGISTIC SUPPORT ANALYSIS RECORD DATE 11/10/76 001

RELIABILITY AND MAINTENANCE SUMMARY

END ITEM ACRONYM	LSA CONTROL NUMBER	MFR PART NUMBER	FSCM	ITEM NAME	SERVICE DESIGNATION	ANNUAL OPERATING REQUIREMENTS
TESTDA	1	XM-1234	X1234	WEAPON SYSTEM	ARMY	1000 MILES

OPERATOR/CREW MAINTENANCE TOTALS:

	DAILY INSPECTION ELAP	DAILY INSPECTION MAN	PREOPERATIVE INSPECTION ELAP	PREOPERATIVE INSPECTION MAN	POSTOPERATIVE INSPECTION ELAP	POSTOPERATIVE INSPECTION MAN	INTERMEDIATE INSPECTION ELAP	INTERMEDIATE INSPECTION MAN	PERIODIC INSPECTION ELAP	PERIODIC INSPECTION MAN	ANNUAL MAINTENANCE MAN-HRS PER END ITEM SCHED	UNSCH	TOTAL	MAINTENANCE RATIO SCHED	UNSCH	TOTAL
STATUS			.20	.40							40.5		40.5	.041		.041

ORGANIZATIONAL/AVUM MAINTENANCE TOTALS:

	DAILY INSPECTION ELAP	DAILY INSPECTION MAN	PREOPERATIVE INSPECTION ELAP	PREOPERATIVE INSPECTION MAN	POSTOPERATIVE INSPECTION ELAP	POSTOPERATIVE INSPECTION MAN	INTERMEDIATE INSPECTION ELAP	INTERMEDIATE INSPECTION MAN	PERIODIC INSPECTION ELAP	PERIODIC INSPECTION MAN	TURN AROUND TIME ELAP	TURN AROUND TIME MAN	MISSION PROFILE CHANGE ELAP	MISSION PROFILE CHANGE MAN
REQD	.5	1.0	.5	1.0	.5	1.0	2.0	4.0	3.0	6.0	2.0	4.0	2.0	4.0
STATUS									2.00	4.00			1.50	3.50

INTERMEDIATE SUPPORT/AVIM/AFLOAT MAINTENANCE TOTALS:

	INTERMEDIATE INSPECTION ELAP	INTERMEDIATE INSPECTION MAN	PERIODIC INSPECTION ELAP	PERIODIC INSPECTION MAN	ANNUAL MAINTENANCE MAN-HRS PER END ITEM SCHED	UNSCH	TOTAL	MAINTENANCE RATIO SCHED	UNSCH	TOTAL
REQD	2.0	4.0	2.0	4.0	50.0	150.0		.5	1.2	
STATUS						6.5	6.5		.006	.006

ANNUAL MAINTENANCE MAN-HRS PER END ITEM SCHED	UNSCH	TOTAL	MAINTENANCE RATIO SCHED	UNSCH	TOTAL
200.0	400.0		.5	1.2	
16.0	68.2	84.2	.016	.068	.084

INTERMEDIATE/G.S./ASHORE MAINTENANCE TOTALS:

	ANNUAL MAINTENANCE MAN-HRS PER END ITEM SCHED	UNSCH	TOTAL	MAINTENANCE RATIO SCHED	UNSCH	TOTAL
REQD	5.0	100.0		.3	1.0	
STATUS		15.0	15.0		.015	.015

DEPOT/SHIPYARDS/SPECIALIZED REPAIR FACILITY MAINTENANCE TOTALS:

	ANNUAL MAINTENANCE MAN-HRS PER END ITEM SCHED	UNSCH	TOTAL	MAINTENANCE RATIO SCHED	UNSCH	TOTAL
REQD			30.0			.6
STATUS	11.0		11.0	.011		.011

OVERALL MAINTENANCE TOTALS (ALL MAINTENANCE LEVELS):

TOTAL ANNUAL MAINTENANCE MAN-HOURS PER END ITEM -	157.2	MAINTENANCE RATIO -	.157
SCHEDULED -	67.5	SCHEDULED -	.068
UNSCHEDULED -	89.7	UNSCHEDULED -	.090

FIGURE B-13. LSA-03 SUMMARY

LSA-04 LOGISTIC SUPPORT ANALYSIS RECORD DATE 11/10/76 PAGE 001

MAINTENANCE ALLOCATION SUMMARY

END ITEM ACRONYM	LSA CONTROL NUMBER	MFR PART NUMBER	FSCM	ITEM NAME	SERVICE DESIGNATION
TESTDA	1	XM-1234	X1234	WEAPON SYSTEM	ARMY

GROUP NUMBER	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	MAINTENANCE CATEGORY C	D	F	H	D	TOOLS AND EQUIPMENT
1	WEAPON SYSTEM	INSPECT	.40	4.00	.00	.00	.00	001 002 003
		SERVICE	.25	.00	.00	.00	.00	001 002
		OVERHAUL	.00	.00	.00	.00	110.00	001 002 003 006 007 008 009
		MISSION PROFILE CHANGE	.00	3.50	.00	.00	.00	001 002
101	SYSTEM-1	REMOVE/REPLACE	.00	.50	.00	.00	.00	001 002
		REPAIR	.00	1.00	.00	.00	.00	001 002
10110	INPUT DRIVE	ADJUST	.00	.50	.00	.00	.00	003 005 007 008
		REMOVE/REPLACE	.00	2.50	.00	.00	.00	001 002 003 006
10110A	IO-ASSEMBLY-1	REMOVE/REPLACE	.00	.00	1.00	.00	.00	001 002
		REPAIR	.00	.00	1.00	.00	.00	001 002
10110A3	IO-GEAR BOX	REMOVE/REPLACE	.00	.00	.00	1.00	.00	001 002 003
		REPAIR	.00	.00	.00	2.00	.00	001 002 007 008 010
10110B	IO-ASSEMBLY-2	REMOVE/REPLACE	.00	.00	3.00	.00	.00	001 002
		REPAIR	.00	.00	.00	2.50	.00	001 002 007 008 010
10120	MID-DRIVE	REMOVE/REPLACE	.00	4.00	.00	.00	.00	001 002
		REPAIR	.00	.00	3.00	.00	.00	001 002 008 010
10130	OUTPUT DRIVE	ADJUST	.00	.50	.00	.00	.00	003 005 007 008
		REMOVE/REPLACE	.00	3.00	.00	.00	.00	001 002
		REPAIR	.00	.00	3.00	.00	.00	001 002 010
102	SYSTEM-2	REMOVE/REPLACE	.00	2.00	.00	.00	.00	001 002 003
		REPAIR	.00	3.00	.00	.00	.00	001 002 003
10210	PRE-AMP	REMOVE/REPLACE	.00	.25	.00	.00	.00	003 004 009 011

FIGURE B-14. LSA-04 SUMMARY

LSA-05 LOGISTIC SUPPORT ANALYSIS RECORD DATE 11/10/76 PAGE 006

SUPPORT ITEM UTILIZATION SUMMARY

END ITEM ACRONYM	LSA CONTROL NUMBER	MFR PART NUMBER	ITEM NAME	SERVICE DESIGNATION	ITEM CATEGORY CODES SELECTED
TESTDA	1	XM-1234	WEAPON SYSTEM	ARMY	K,J,L,

SUPPORT ITEM PART NUMBER CSE-3 ITEM NAME SCREWDRIVER ITEM CATEGORY CODE K

MAINT LEVEL	LSA CONTROL NUMBER	ITEM NAME	TASK CODE	TASK IDENTIFICATION	TASK FREQ	ELAP TIME	MAN-HOURS	QTY PER TASK
ORG	10210	PRE-AMP	HGOFFAA	REMOVE AND REPLACE THE PRE-AMPLIFIER	.50	.25	.25	1.0
	10220	MAIN AMP	HGOFFAA	REMOVE AND REPLACE THE MAIN AMPLIFIER	2.00	1.50	1.50	1.0
	103	SYSTEM-3	HGOFFAA	REMOVE AND REPLACE SYSTEM-3	3.00	2.50	5.00	1.0
			JGOFFAA	REPLACE LEAKY GASKET	1.00	3.00	6.00	1.0
			JGOFFAB	REPLACE LEAKY SEAL	1.00	.50	.50	1.0
	10310	PUMP ASSEMBLY	HGOFFAA	REMOVE AND REPLACE THE PUMP ASSEMBLY	1.50	2.00	2.00	1.0
			JGOFFAA	REPLACE LEAKY PUMP ASSEMBLY GASKET	.50	2.50	2.50	1.0
	10320	ACTUATOR ASSEMBLY	HGOFFAA	REMOVE AND REPLACE ACTUATOR ASSEMBLY	1.50	2.00	2.00	1.0
			JGOFFAB	REPLACE ACTUATOR ASSEMBLY GASKET	2.00	3.00	4.50	1.0
**** ANNUAL REQUIREMENTS FOR MAINT LEVEL **********						42.13		24.50
**** ANNUAL REQUIREMENTS FOR ALL MAINT LEVELS **********						52.11		30.25

SUPPORT ITEM PART NUMBER CSE-6 ITEM NAME MULTIMETER ITEM CATEGORY CODE L

MAINT LEVEL	LSA CONTROL NUMBER	ITEM NAME	TASK CODE	TASK IDENTIFICATION	TASK FREQ	ELAP TIME	MAN-HOURS	QTY PER TASK
D.S.	102102	BOARD-1	HGFHHYA	REMOVE AND REPLACE CIRCUIT BOARD-1	.25	.10	.10	1.0
	102103	BOARD-2	HGFHHYA	REMOVE AND REPLACE CIRCUIT BOARD-2	.25	.10	.10	1.0
	102202	RACK-1	HGFHHYA	REMOVE AND REPLACE MAIN-AMP RACK-1	1.50	.30	.30	1.0
	102203	RACK-2	HGFHHYA	REMOVE AND REPLACE MAIN-AMP RACK-2	.50	.30	.30	1.0
**** ANNUAL REQUIREMENTS FOR MAINT LEVEL **********						.65		2.50

FIGURE B-15. LSA-05 SUMMARY

LSA-06 LOGISTIC SUPPORT ANALYSIS RECORD DATE 11/10/76 PAGE 0001

CRITICAL MAINTENANCE TASK SUMMARY

END ITEM ACRONYM	LSA CONTROL NUMBER	MFR PART NUMBER	FSCM	ITEM NAME	SERVICE DESIGNATION
TESTDA	1	XM-1234	X1234	WEAPON SYSTEM	ARMY

CRITICAL CRITERIA: 1. THE FOLLOWING TASKS EXCEED 001.00 FOR ANNUAL MAN-HOURS PER TASK

2. THIS REPORT COVERS CREW, ORG, D.S., G.S., ASM&AFL, DEPOT, MAINTENANCE LEVEL(S).

LSA CONTROL NUMBER	ITEM NAME	PART NUMBER	FSCM	TASK CODE	TASK IDENTIFICATION	TASK FREQ	FLAP TIME	MAN HOURS	ANNUAL MAN-HOURS
1	WEAPON SYSTEM	XM-1234	X1234	AACOOBA	PREOPERATIVE END ITEM INSPECTION	100.00	.20	.40	40.0000
1	WEAPON SYSTEM	XM-1234	X1234	AEOFFBA	PERIODIC END ITEM INSPECTION	4.00	2.00	4.00	16.0000
1	WEAPON SYSTEM	XM-1234	X1234	KRODDAA	END ITEM OVERHAUL TASK	.10	50.00	110.00	11.0000
1	WEAPON SYSTEM	XM-1234	X1234	MGOFFAA	END ITEM MISSION PROFILE CHANGE	1.00	1.50	3.50	3.5000
10110	INPUT DRIVE	INPUT-DRIVE-PART-NUMBER	X1234	HGOFFAA	REMOVE AND REPLACE INPUT DRIVE ASSEMBLY	.50	2.50	2.50	1.2500
10130	OUTPUT DRIVE	OD-PART-NUMBER	X1234	HGOFFAA	REMOVE AND REPLACE OUTPUT DRIVE ASSEMBLY	.50	1.50	3.00	1.5000
102	SYSTEM-2	SYSTEM-2PN	X1234	HGOFFAA	REMOVE AND REPLACE SYSTEM-2	2.00	1.00	2.00	4.0000
102	SYSTEM-2	SYSTEM-2PN	X1234	JGOFFAA	REPAIR LEAKY GASKET	1.00	1.50	3.00	3.0000
10220	MAIN AMP	MA-PN	X1234	HGOFFAA	REMOVE AND REPLACE THE MAIN AMPLIFIER	2.00	1.50	1.50	3.0000
1022021	BOARD-11	CB-5	X1234	JGHDDYA	REPAIR CIRCUIT BOARD -11	.90	1.25	1.25	1.1250
103	SYSTEM-3	SYSTEM-3PN	X1234	HGOFFAA	REMOVE AND REPLACE SYSTEM-3	3.00	2.50	5.00	15.0000
103	SYSTEM-3	SYSTEM-3PN	X1234	JGOFFAA	REPLACE LEAKY GASKET	1.00	3.00	6.00	6.0000

FIGURE B-16. LSA-06 SUMMARY

LSA-07 LOGISTIC SUPPORT ANALYSIS RECORD DATE 11/10/76 001

SUPPORT ITEM REQUIREMENTS BY SKILL SPECIALTY CODE AND MAINTENANCE CATEGORY

END ITEM ACRONYM	LSA CONTROL NUMBER	MFR PART NUMBER	FSCM	ITEM NAME	SERVICE DESIGNATION	ITEM CATEGORY CODES SELECTED
TESTDA	1	XM-1234	X1234	WEAPON SYSTEM	ARMY	JKLM

SKILL SPECIALTY CODE	MAINT CAT	ICC	ITEM NAME	PART NUMBER	LCN	TASK CODE	TASK IDENTIFICATION
WG05	DEPOT	K	SCREWDRIVER	CSE-3	1	KRDDDAA	END ITEM OVERHAUL TASK
		K	SOCKET	CSE-2	1	KRDDDAA	END ITEM OVERHAUL TASK
		K	WRENCH	CSE-1	1	KRDDDAA	END ITEM OVERHAUL TASK
WG06	DEPOT	K	WRENCH	CSE-1	1	KRDDDAA	END ITEM OVERHAUL TASK
		K	SOCKET	CSE-2	1	KRDDDAA	END ITEM OVERHAUL TASK
		K	SCREWDRIVER	CSE-3	1	KRDDDAA	END ITEM OVERHAUL TASK
WG07	DEPOT	K	SCREWDRIVER	CSE-3	1	KRDDDAA	END ITEM OVERHAUL TASK
		K	WRENCH	CSE-1	1	KRDDDAA	END ITEM OVERHAUL TASK
		K	SOCKET	CSE-2	1	KRDDDAA	END ITEM OVERHAUL TASK
11B20	CREW	K	SOCKET	CSE-2	1	CBCODAA	SEMIANNUAL END ITEM SERVICE
		K	WRENCH	CSE-1	1	CBCODAA	SEMIANNUAL END ITEM SERVICE
	ORG	K	SOCKET	CSE-2	1	MGOFFAA	END ITEM MISSION PROFILE CHANGE
		K	WRENCH	CSE-1	1	MGOFFAA	END ITEM MISSION PROFILE CHANGE
35A20	ORG	K	SCREWDRIVER	CSE-3	10210	HGOFFAA	REMOVE AND REPLACE THE PRE-AMPLIFIER
		K	SCREWDRIVER	CSE-3	10220	HGOFFAA	REMOVE AND REPLACE THE MAIN AMPLIFIER
		L	MULTIMETER	CSE-6	10220	HGOFFAA	REMOVE AND REPLACE THE MAIN AMPLIFIER
		L	MULTIMETER	CSE-6	10210	HGOFFAA	REMOVE AND REPLACE THE PRE-AMPLIFIER
35A30	D.S.	L	MULTIMETER	CSE-6	102102	HGFHHYA	REMOVE AND REPLACE CIRCUIT BOARD-1

FIGURE B-17. LSA-07 SUMMARY

LSA-08 LOGISTIC SUPPORT ANALYSIS RECORD DATE 11/10/76 001

SUPPORT ITEM REQUIREMENTS BY MAINTENANCE CATEGORY AND SKILL SPECIALTY CODE

END ITEM ACRONYM	LSA CONTROL NUMBER	MFR PART NUMBER	FSCM	ITEM NAME	SERVICE DESIGNATION	ITEM CATEGORY CODES SELECTED
TESTDA	1	XM-1234	X1234	WEAPON SYSTEM	ARMY	JKLM

MAINT CAT	SKILL SPECIALTY CODE	I C C	ITEM NAME	PART NUMBER	LCN	TASK CODE	TASK IDENTIFICATION
CREW	11B20	K	SOCKET	CSE-2	1	CBCOOAA	SEMIANNUAL END ITEM SERVICE
		K	WRENCH	CSE-1	1	CBCOOAA	SEMIANNUAL END ITEM SERVICE
DEPOT	WG05	K	SCREWDRIVER	CSE-3	1	KRDDDAA	END ITEM OVERHAUL TASK
		K	WRENCH	CSE-1	1	KRDDDAA	END ITEM OVERHAUL TASK
		K	SOCKET	CSE-2	1	KRDDDAA	END ITEM OVERHAUL TASK
	WG06	K	SOCKET	CSE-2	1	KRDDDAA	END ITEM OVERHAUL TASK
		K	WRENCH	CSE-1	1	KRDDDAA	END ITEM OVERHAUL TASK
		K	SCREWDRIVER	CSE-3	1	KRDDDAA	END ITEM OVERHAUL TASK
	WG07	K	SCREWDRIVER	CSE-3	1	KRDDDAA	END ITEM OVERHAUL TASK
		K	WRENCH	CSE-1	1	KRDDDAA	END ITEM OVERHAUL TASK
		K	SOCKET	CSE-2	1	KRDDDAA	END ITEM OVERHAUL TASK
D.S.	35A30	L	MULTIMETER	CSE-6	102102	HGFHHYA	REMOVE AND REPLACE CIRCUIT BOARD-1
		L	MULTIMETER	CSE-6	102103	HGFHHYA	REMOVE AND REPLACE CIRCUIT BOARD-2
		L	MULTIMETER	CSE-6	102202	HGFHHYA	REMOVE AND REPLACE MAIN-AMP RACK-1
		L	MULTIMETER	CSE-6	102203	HGFHHYA	REMOVE AND REPLACE MAIN-AMP RACK-2
	63C30	K	SOCKET	CSE-2	10120	JGFHHYA	REPAIR MID-DRIVE ASSY-REPLACE SHAFT
		K	WRENCH	CSE-1	10120	JGFHHYA	REPAIR MID-DRIVE ASSY-REPLACE SHAFT
		K	SOCKET	CSE-2	10120	JGFHHYB	REPAIR MID-DRIVE ASSY-REPLACE GEAR

FIGURE B-18. LSA-08 SUMMARY

LSA-09 LOGISTIC SUPPORT ANALYSIS RECORD DATE 11/10/76 PAGE 001

SUPPORT ITEMS LIST

END ITEM ACRONYM	LSA CONTROL NUMBER	MFR PART NUMBER	FSCM	ITEM NAME	SERVICE DESIGNATION
	1	XM-1234	X1234	WEAPON SYSTEM	ARMY

ITEMS SELECTED: ITEM CATEGORY CODES A,B,C,D,1,2,3,4,K,
PROVISIONING LIST CATEGORY CODES A,B,C,D,E,F

LSA CONTROL NUMBER	PART NUMBER	FSCM	ITEM NAME / NAT STOCK NUMBER	TYPE OF ITEM	ITEM CAT CODE	U/M PLT	EC SL	QTY/EI QTY REC	UNIT PRICE	PSPC PPC	QTY PER ASSY	SMR	REMARKS
101	SYSTEM-1PN	X1234	SYSTEM-1 1111-00-999-1111	C	Y	EA 18	1	00001 000075	6.10	H	1	PADHD	OVRHAUL-CAND
102	SYSTEM-2PN	X1234	SYSTEM-2 2222-00-999-2222	C	Y	EA 19	7	00001 000064	1.20	C P	1	PADHD	OECOM-MANAGD
103205	ACT-1	X1234	ACTUATOR-1 1111-00-222-3333	MF	Y	EA 05	5	00001 000100	1.50	U	1	PAFHH	MTSP-APG-DT2
19701	BULK-1	X1234	GREASE 1111-00-999-1111	ZE	Q	DR 03	3	00000 003000	.25	U	1	PADZZ	MTSP-APG-DT2
19702	BULK-2	X1234	OIL 1111-00-999-1112	E	Q	 00		00000 000000	.00		BUL2	PADFF	
19703	BULK-3	X1234	WIRE 1111-00-999-1113	E	Q	 00		00000 000000	.00		BUL2	PADFF	
19801	PSE-1	X1234	ENGINE DIAGNOSER 5500-00-123-4567	ADB	A	EA 05	7 A	00001 000010	1500.00	U P	1	PADFD	REMARKS-NONE
19802	PSE-2	X2222	TRAINING DEVICE-1 5500-01-231-0102	BAD	S	EA 04	1 B	00001 000005	500.00	A P	1	PADDD	REMARKS-1
19803	PSE-3	X3333	SPECIAL TOOL-1 - - -	CDA	B	EA 02	3 C	00001 000050	15.50		1	PADFF	REMARKS-2
19804	PSE-4	X4444	SPECIAL TOOL-2 5502-00-321-7654	DDA	B	EA 01	5 D	00001 000040	290.00	C P	1	PADFF	REMARKS-3
19805	PSE-5	X1111	CRANE 5510-00-123-4563	EAC	3	EA 03	6 E	00001 000002	3000.00	D	1	PADFD	REMARKS-4
19806	PSE-6	X1111	CALIBRATOR 5506-00-123-3214	FDB	C	EA 07	7 F	00001 000010	150.00	E P	1	PAFFF	REMARKS-5

FIGURE B-19. LSA-09 SUMMARY

LSA-10 LOGISTIC SUPPORT ANALYSIS RECORD DATE 11/10/76 PAGE 002

SUPPORT ITEMS LIST

END ITEM ACRONYM	LSA CONTROL NUMBER	MFR PART NUMBER	FSCM	ITEM NAME	SERVICE DESIGNATION
	1	XM-1234	X1234	WEAPON SYSTEM	ARMY

ITEMS SELECTED: ITEM CATEGORY CODES A,B,C,D,1,2,3,4,K,
PROVISIONING LIST CATEGORY CODES A,B,C,D,E,F

PART NUMBER	FSCM	ITEM NAME / NAT STOCK NUMBER	TYPE OF ITEM	ITEM CAT CODE	U/M PLT	EC SL	QTY/EI QTY REC	UNIT PRICE	PSPC PPC	LSA CONTROL NUMBER	QTY PER ASSY	SMR	REMARKS
CSE-9	X1234	GROUND HOP SET	A	H			00000	.00		19909	1	PAFFF	
		4444-00-666-4119			00		000000						
PSE-1	X1234	ENGINE DIAGNOSER	ADB	A	EA	7	00001	1500.00	U	19801	1	PAOFD	REMARKS-NONE
		5500-00-123-4567			05	A	000010		P				
PSE-2	X2222	TRAINING DEVICE-1	BAD	S	EA	1	00001	500.00	A	19802	1	PADDO	REMARKS-1
		5500-01-231-0102			04	B	000005		P				
PSE-3	X3333	SPECIAL TOOL-1	CDA	B	EA	3	00001	15.50		19803	1	PAOFF	REMARKS-2
		- - -			02	C	000050						
PSE-4	X4444	SPECIAL TOOL-2	DDA	B	EA	5	00001	290.00	C	19804	1	PAOFF	REMARKS-3
		5502-00-321-7654			01	D	000040		P				
PSE-5	X1111	CRANE	EAC	3	EA	6	00001	3000.00	D	19805	1	PAOFD	REMARKS-4
		5510-00-123-4563			03	E	000002						
PSE-6	X1111	CALIBRATOR	FDB	C	EA	7	00001	150.00	E	19806	1	PAFFF	REMARKS-5
		5506-00-123-3214			07	F	000010		P				
PSE-7	X1111	TRAINING DEVICE-2	GAD	S	EA	1	00001	900.00	F	19807	1	PAFFD	REMARKS-6
		5501-00-654-3456			06	G	000002		P				
PSE-8	X1111	HANDLING DEVICE	HBC	D	EA	3	00001	1000.00	G	19808	1	PAHHH	REMARKS-7
		5502-00-654-6543			05	H	000005						
PSE-9	X1111	WHEEL PULLER	JDA	1	EA	5	00001	50.00	H	19809	1	PAHHD	REMARKS-8
		5502-00-333-4444			03	J	000010		P				
PSE-91	X1111	TMDE-1	KDB	2	EA	6	00001	600.00	J	19810	1	PAHDD	REMARKS-9
		5505-00-444-5555			02	K	000015						
PSE-92	X1111	TMDE-2	LDB	2	EA	7	00001	.00	K	19811	1	PADDD	REMARKS-10
		5505-00-666-5555			07	L	000020		P				

FIGURE B-20. LSA-10 SUMMARY

Appendix B--Continued

LSA-11 LOGISTIC SUPPORT ANALYSIS RECORD DATE 11/10/76 PAGE 001

SPECIAL TRAINING DEVICE REQUIREMENTS

END ITEM ACRONYM	LSA CONTROL NUMBER	MFR PART NUMBER	FSCM	ITEM NAME	SERVICE DESIGNATION
TESTDA	1	XM-1234	X1234	WEAPON SYSTEM	ARMY

LSA CONTROL NUMBER	ITEM NAME	TASK CODE	TASK IDENTIFICATION	TASK FREQ	ELAP TIME	SKILL SPECIALTY	MAN-HOURS
10110	INPUT DRIVE	DGDFFAA	ADJUST INPUT DRIVE ASSEMBLY	2.00	.50	63C20	.50
10130	OUTPUT DRIVE	DGDFFAA	ADJUST OUTPUT DRIVE ASSEMBLY	2.00	.50	63C20	.50
1022021	BOARD-11	JGHDDYA	REPAIR CIRCUIT BOARD-11	.90	1.25	35A40	1.25
1022022	BOARD-12	JGHDDYA	REPAIR CIRCUIT BOARD-2	.40	1.25	35A40	1.25
102203	RACK-2	JGHDDYA	REPAIR RACK-2, REMOVE/REPLACE CARD-1	.25	.80	35A40	.80
102203	RACK-2	JGHDDYB	REPAIR RACK-2,REMOVE/REPLACE CARD-2	.25	.80	35A40	.80
103205	ACTUATOR-1	BGHDDYA	TEST ACTUATOR-1	.50	.20	67A40	.20
103206	ACTUATOR-2	BGHDDYA	TEST ACTUATOR-2	1.00	.20	67A40	.20

FIGURE B-21. LSA-11 SUMMARY

LSA-12 LOGISTIC SUPPORT ANALYSIS RECORD DATE 11/10/76 PAGE 001

SPECIAL FACILITY REQUIREMENTS

END ITEM ACRONYM	LSA CONTROL NUMBER	MFR PART NUMBER	FSCM	ITEM NAME	SERVICE DESIGNATION
TESTDA	1	XM-1234	X1234	WEAPON SYSTEM	ARMY

LSA CONTROL NUMBER	ITEM NAME	TASK CODE	TASK IDENTIFICATION	TASK FREQ	ELAP TIME	SKILL SPECIALTY	MAN-HOURS
1	WEAPON SYSTEM	KRDDDAA	END ITEM OVERHAUL TASK	.10	50.00	WG06	25.00
1	WEAPON SYSTEM	KRDDDAA	END ITEM OVERHAUL TASK	.10	50.00	WG05	75.00
1	WEAPON SYSTEM	KRDDDAA	END ITEM OVERHAUL TASK	.10	50.00	WG07	10.00
103265	ACTUATOR-1	BGHDDYA	TEST ACTUATOR-1	.50	.20	67A40	.20
103266	ACTUATOR-2	BGHDDYA	TEST ACTUATOR-2	1.00	.20	67A40	.20

FIGURE B-22. LSA-12 SUMMARY

LSA-13 LOGISTIC SUPPORT ANALYSIS RECORD DATE 11/10/76 001

SUPPORT EQUIPMENT GROUPING NUMBER UTILIZATION SUMMARY

END ITEM ACRONYM	LSA CONTROL NUMBER	MFR PART NUMBER	FSCM	ITEM NAME	SERVICE DESIGNATION	GROUPING NUMBER SELECTED
TESTDA	1	XM-1234	X1234	WEAPON SYSTEM	ARMY	ALL

SUPPORT EQUIPMENT GROUPING IDENTIFICATION NUMBER 100

MAINT LEVEL	LSA CONTROL NUMBER	ITEM NAME	TASK CODE	TASK IDENTIFICATION	TASK FREQ	ELAP TIME	MAN-HOURS
DEPOT	1	WEAPON SYSTEM	KRDDDAA	END ITEM OVERHAUL TASK	.10	50.00	75.00

SUPPORT EQUIPMENT GROUPING IDENTIFICATION NUMBER 200

MAINT LEVEL	LSA CONTROL NUMBER	ITEM NAME	TASK CODE	TASK IDENTIFICATION	TASK FREQ	ELAP TIME	MAN-HOURS
ORG	10110	INPUT DRIVE	DGOFFAA	ADJUST INPUT DRIVE ASSEMBLY	2.00	.50	.50
	10130	OUTPUT DRIVE	DGOFFAA	ADJUST OUTPUT DRIVE ASSEMBLY	2.00	.50	.50

SUPPORT EQUIPMENT GROUPING IDENTIFICATION NUMBER 300

MAINT LEVEL	LSA CONTROL NUMBER	ITEM NAME	TASK CODE	TASK IDENTIFICATION	TASK FREQ	ELAP TIME	MAN-HOURS
D.S.	102102	BOARD-1	HGFHHYA	REMOVE AND REPLACE CIRCUIT BOARD-1	.25	.10	.10
	102103	BOARD-2	HGFHHYA	REMOVE AND REPLACE CIRCUIT BOARD-2	.25	.10	.10
	102202	RACK-1	HGFHHYA	REMOVE AND REPLACE MAIN-AMP RACK-1	1.50	.30	.30
	102203	RACK-2	HGFHHYA	REMOVE AND REPLACE MAIN-AMP RACK-2	.50	.30	.30
G.S.			JGHDDYB	REPAIR RACK-2,REMOVE/REPLACE CARD-2	.25	.80	.80
			JGHDDYA	REPAIR RACK-2, REMOVE/REPLACE CARD-1	.25	.80	.80

FIGURE B-23. LSA-13 SUMMARY

LSA-20 LOGISTIC SUPPORT ANALYSIS RECORD DATE 11/10/76 PAGE 001

TOOL AND TEST EQUIPMENT REQUIREMENTS

END ITEM ACRONYM	LSA CONTROL NUMBER	MFR PART NUMBER	FSCM	ITEM NAME	SERVICE DESIGNATION	ITEM CATEGORY CODES SELECTED
TESTDA	1	XM-1234	X1234	WEAPON SYSTEM	ARMY	ABCE12H45JKL

TOOL OR TEST EQUIPMENT REFERENCE CODE	MAINTENANCE CATEGORY	ITEM NAME	NATIONAL/NATO STOCK NUMBER	TOOL NUMBER	FSCM
001	C,D,F,H,O	WRENCH	4444-00-666-4111	CSE-1	A1111
002	C,D,F,H,O	SOCKET	4444-00-666-4111	CSE-2	X1234
003	D,F,H,O	SCREWDRIVER	4444-00-666-4113	CSE-3	X1234
004	F,H,O	MULTIMETER	4444-00-666-4116	CSE-6	X1234
005	O	GUAGE	4444-00-666-4117	CSE-7	X1234
006	D,O	HOIST	4444-00-666-4118	CSE-8	X1234
007	D,H,O	SPECIAL TOOL-1	- - -	PSE-3	X3333
008	D,F,H,O	SPECIAL TOOL-2	5502-00-321-7654	PSE-4	X4444
009	D,H,O	CALIBRATOR	5506-00-123-3214	PSE-6	X1111
010	F,H,O	WHEEL PULLER	5502-00-333-4444	PSE-9	X1111
011	F,H,O	TMDE-1	5505-00-444-5555	PSE-91	X1111
012	H	TMDE-2	5505-00-666-5555	PSE-92	X1111

FIGURE B-24. LSA-20 SUMMARY

LSA-26 'OGISTIC SUPPORT ANALYSIS RECORD DATE 11/10/76 PAGE 0002

REPAIR PARTS LIST

FOR ALL LEVELS OF MAINTENANCE

END ITEM ACRONYM	LSA CONTROL NUMBER	MFR PART NUMBER	FSCM	ITEM NAME	SERVICE DESIGNATION
	1	XM-1234	X1234	WEAPON SYSTEM	ARMY

GROUP CODE	ILLUSTRATION FIGURE NO.	ILLUSTRATION ITEM NO.	SMR CODE	NATIONAL STOCK NUMBER	PART NUMBER	FSCM	ITEM NAME	USABLE ON CODE	U/M	QTY PER ASSY
10110A1	5	3	PAFFF	9999-00-111-9994	MS-4	X1234	NUT			4
10110A1	6	2	PAFFF	9999-00-111-9994	MS-4	X1234	NUT			4
10110A2	5	4	PAFFF	9999-00-111-9995	MS-5	X1234	WASHER			4
10110A3	6	4	PAFHH	- - -	GB-1	X1234	ID-GEAR BOX			1
10110A31	6	5	PAHHH	- - -	R-1	X1234	RING			1
10110A32	6	6	PAHHH	5555-00-555-6111	G-1	X1234	GEAR-1			1
10110A33	6	7	PAHHH	5555-00-555-6112	G-2	X1234	GEAR-2			1
10110A4	6	8	PAFHH	7777-00-333-8111	H-1	X1234	HOUSING			1
10110B	5	5	PAFHH	8888-00-222-9112	IDA-2	X1234	ID-ASSEMBLY-2			1
10110B	7	1	PAFHH	8888-00-222-9112	IDA-2	X1234	ID-ASSEMBLY-2			1
10110B1	5	6	PAFFF	9999-00-111-9994	MS-4	X1234	NUT			4
10110B1	7	2	PAFFF	9999-00-111-9994	MS-4	X1234	NUT			4
10110B2	5	7	PAFFF	9999-00-111-9995	MS-5	X1234	WASHER			4
10110B2	7	3	PAFFF	9999-00-111-9995	MS-5	X1234	WASHER			4
10110B3	5	8	PAFFF	9999-00-111-9996	MS-6	X1234	BOLT			4
10110B3	7	4	PAFFF	9999-00-111-9996	MS-6	X1234	BOLT			4
10110B4	7	5	PAHHH	1114-00-444-1411	P-1	X1234	PLATE			1
10110B5	7	6	PAHHH	- - -	R-1	X1234	RING			1
10110B6	7	7	PAHHH	5555-00-555-6114	G-4	X1234	GEAR-4			1
10110B7	7	8	PAHHH	5555-00-555-6115	G-5	X1234	GEAR-5			1
10120	3	8	PAOFF	1112-00-222-1312	MID-DRIVE-PART-NUMBER	X1234	MID-DRIVE			1
10120	4	8	PAOFF	1112-00-222-1312	MID-DRIVE-PART-NUMBER	X1234	MID-DRIVE			1
10120	8	1	PAOFF	1112-00-222-1312	MID-DRIVE-PART-NUMBER	X1234	MID-DRIVE			1
101201	3	9	PAOZZ	9999-00-111-9991	MS-1	X1234	NUT	PAA PCC	HD	2
101201	4	9	PAOZZ	9999-00-111-9991	MS-1	X1234	NUT	PAA PCC	HD	2
101201	8	2	PAOZZ	9999-00-111-9991	MS-1	X1234	NUT	PAA PCC	HD	2
101202	3	10	PAOOO	9999-00-111-9993	MS-3	X1234	BOLT			2
101202	4	10	PAOOO	9999-00-111-9993	MS-3	X1234	BOLT			2
101202	8	3	PAOOO	9999-00-111-9993	MS-3	X1234	BOLT			2
101203	8	4	PAFFF	1114-00-444-1412	P-2	X1234	PLATE			1
101204	8	5	PAFFF	- - -	R-2	X1234	RING			1
101205	8	6	PAFFF	5555-00-555-6114	G-4	X1234	GEAR-4			1
101206	8	7	PAFFF	- - -	S-3	X1234	SHAFT			1
10130	3	11	PAOFF	1113-00-333-1411	OD-PART-NUMBER	X1234	OUTPUT DRIVE			1

FIGURE B-25. LSA-26 SUMMARY

LSA-27 LOGISTIC SUPPORT ANALYSIS RECORD DATE 11/10/76 PAGE 0002

SPECIAL TOOLS LIST

FOR ALL LEVELS OF MAINTENANCE

END ITEM ACRONYM	LSA CONTROL NUMBER	MFR PART NUMBER	FSCM	ITEM NAME	SERVICE DESIGNATION
	1	XM-1234	X1234	WEAPON SYSTEM	ARMY

GROUP CODE	ILLUSTRATION FIGURE NO.	ILLUSTRATION ITEM NO.	SMR CODE	NATIONAL STOCK NUMBER	PART NUMBER	FSCM	ITEM NAME	USABLE ON CODE	U/M	QTY PER ASSY
							AUTH PER HQ OF UNITS ABOVE BN LEVEL			
19804	203	1	PAOFF	5502-00-321-7654	PSE-4	X4444	SPECIAL TOOL-2	PAA	EA	1
							BOI: 2AUTH FOR 1-10	EQUIP		
							4AUTH FOR 11-20	EQUIP		
							5AUTH FOR ABOVE 20	EQUIP		
							AUTH PER HQ OF UNITS ABOVE BN LEVEL			
19805	104	1	PAOFD	5510-00-123-4563	PSE-5	X1111	CRANE	PAA	EA	1
							PBB			
							BOI: 12345AUTH FOR 5-10	EQUIP		
							AUTH PER LETTERED COMPANY			
19805	204	1	PAOFD	5510-00-123-4563	PSE-5	X1111	CRANE	PAA	EA	1
							PBB			
							BOI: 12345AUTH FOR 5-10	EQUIP		
							AUTH PER LETTERED COMPANY			
19806	105	1	PAFFF	5506-00-123-3214	PSE-6	X1111	CALIBRATOR	PAA	EA	1
							PBB			
							BOI: 10AUTH FOR 1-5	EQUIP		
19806	205	1	PAFFF	5506-00-123-3214	PSE-6	X1111	CALIBRATOR	PAA	EA	1
							PBB			
							BOI: 10AUTH FOR 1-5	EQUIP		
19808	107	1	PAHHH	5502-00-654-6543	PSE-8	X1111	HANDLING DEVICE	PAA	EA	1
19808	207	1	PAHHH	5502-00-654-6543	PSE-8	X1111	HANDLING DEVICE	PAA	EA	1
19809	108	1	PAHHD	5502-00-333-4444	PSE-9	X1111	WHEEL PULLER	PAA	EA	1
							BOI: AUTH PER LETTERED COMPANY			
19809	208	1	PAHHD	5502-00-333-4444	PSE-9	X1111	WHEEL PULLER	PAA	EA	1
							BOI: AUTH PER LETTERED COMPANY			
19810	109	1	PAHDD	5505-00-444-5555	PSE-91	X1111	TMDE-1	PAA	EA	1
19810	209	1	PAHDD	5505-00-444-5555	PSE-91	X1111	TMDE-1	PAA	EA	1

FIGURE B-26. LSA-27 SUMMARY

LSA-28 LOGISTIC SUPPORT ANALYSIS RECORD DATE 11/10/76 PAGE 002

NATIONAL STOCK NUMBER AND PART NUMBER INDEX

FOR ALL LEVELS MAINTENANCE

END ITEM ACRONYM	LSA CONTROL NUMBER	MFR PART NUMBER	FSCM	ITEM NAME	SERVICE DESIGNATION
	1	XM-1234	X1234	WEAPON SYSTEM	ARMY

NATIONAL STOCK NUMBER	FIGURE NO.	ITEM NO.
1115-00-555-1511	20	1
1115-00-555-1512	5	7
1115-00-555-1512	17	7
1115-00-555-1512	18	1
2222-00-333-4444	20	10
2222-00-888-2111	11	3
2222-00-888-2113	16	2
2222-00-888-2114	16	3
2222-00-888-2115	15	2
2222-00-999-2222	2	7
2222-00-999-2222	3	7
2222-00-999-2222	4	1
2222-00-999-2222	10	1
3333-00-333-0000	2	13
3333-00-333-0000	3	13
3333-00-333-0000	5	1
3333-00-333-0000	17	1
3333-00-777-3111	15	4
3333-00-777-5111	12	5
3333-00-777-5112	13	2
3333-00-777-5112	15	3
5555-00-555-6111	6	6
5555-00-555-6111	9	5
5555-00-555-6112	6	7
5555-00-555-6112	9	6
5555-00-555-6113	9	7
5555-00-555-6114	7	7
5555-00-555-6114	8	6
5555-00-555-6115	7	8
5555-66-777-8888	11	4
5555-66-777-8888	13	1
5555-66-777-8888	15	6
6666-00-444-7111	2	5
6666-00-444-7111	3	5
6666-00-444-7111	3	5
6666-00-444-7111	4	5
6666-00-444-7112	2	17
6666-00-444-7112	3	17
6666-00-444-7112	5	5
6666-00-444-7112	17	5
6666-00-444-7113	5	9
6666-00-444-7113	17	9
6666-00-444-7113	18	3
6666-00-444-7114	5	15
6666-00-444-7114	17	15
6666-00-444-7114	20	5
6666-00-444-7115	20	8
6666-00-444-7116	20	12
7777-00-333-8111	6	8
7777-00-333-8112	9	4
7777-00-333-8113	2	12
7777-00-333-8113	3	12
7777-00-333-8113	4	6
7777-00-333-8113	10	6
7777-00-333-8114	18	6
8888-00-222-9111	5	2
8888-00-222-9111	6	1
8888-00-222-9112	5	5
8888-00-222-9112	7	1
9999-00-111-1211	3	7
9999-00-111-1211	4	7
9999-00-111-1211	5	1
9999-00-111-9910	18	5
9999-00-111-9910	20	7
9999-00-111-9910	20	11
9999-00-111-9911	5	12
9999-00-111-9911	17	12
9999-00-111-9911	20	2
9999-00-111-9991	2	2
9999-00-111-9991	2	8
9999-00-111-9991	3	2
9999-00-111-9991	3	2
9999-00-111-9991	3	8
9999-00-111-9991	3	9
9999-00-111-9991	3	12
9999-00-111-9991	4	2
9999-00-111-9991	4	2
9999-00-111-9991	4	9
9999-00-111-9991	4	12
9999-00-111-9991	8	2

FIGURE B-27. LSA-28 SUMMARY

LSA-29 LOGISTIC SUPPORT ANALYSIS RECORD DATE 11/10/76 PAGE 0003

REPAIR PARTS LIST

FOR ALL LEVELS OF MAINTENANCE

TM TM-34P

END ITEM ACRONYM	LSA CONTROL NUMBER	MFR PART NUMBER	FSCM	ITEM NAME	SERVICE DESIGNATION
	1	XM-1234	X1234	WEAPON SYSTEM	ARMY

GROUP CODE	ILLUSTRATION FIGURE NO.	ITEM NO.	SMR CODE	NATIONAL STOCK NUMBER	PART NUMBER	FSCM	ITEM NAME	USABLE ON CODE	U/M	QTY PER ASSY
0100	8	7	PAFFF	- - -	S-3	X1234	SHAFT			1
0100	9	1	PAOHF	1113-00-333-1411	OD-PART-NUMBER	X1234	OUTPUT DRIVE			1
0100	9	2	PAOZZ	9999-00-111-9991	MS-1	X1234	NUT	PCC	HD	2
0100	9	3	PAOOO	9999-00-111-9993	MS-3	X1234	BOLT			2
0100	9	4	PAFFF	7777-00-333-8112	H-2	X1234	HOUSING			1
0100	9	5	PAFFF	5555-00-555-6111	G-1	X1234	GEAR-1			1
0100	9	6	PAFFF	5555-00-555-6112	G-2	X1234	GEAR-2			1
0100	9	7	PAFFF	5555-00-555-6113	G-3	X1234	GEAR-3			1
0100	9	8	PAFFF	- - -	S-2	X1234	SHAFT			1
0500	10	1	PAOHD	4222-00-999-2222	SYSTEM-2PN	X1234	SYSTEM-2	PAA	EA	1
								PMM,PNN,PQQ, PPP,POO,PRR, PSS,PTT,PUU, PVV,PWW,PXX PBB,PCC,PDD, PEE,PFF,PGG, PHH,PII,PJJ, PKK,PLL		
0500	10	2	PAOZZ	9999-00-111-9991	MS-1	X1234	NUT	PAA PBB,PCC	HD	4
0500	10	3	PAOOO	9999-00-111-9992	MS-2	X1234	WASHER			4
0500	10	4	PAOOO	- - -	MS-7	X1234	SCREW			5
0500	10	5	PAOOO	- - -	SEAL-1	X1234	SEAL			1
0500	10	6	PAOLO	7777-00-333-8113	H-3	X1234	HOUSING			1
0500	10	7	PAOHH	- - -	MS-1234567890123 4567890	X1234	PRE-AMP			1
0500	10	8	PAOOO	9999-00-111-9999	MS-8	X1234	SCREW			4
0500	10	9	PAOHH	1112-00-222-1311	MA-PN	X1234	MAIN-AMP			1
0500	10	10	PAOOO	9999-00-111-9999	MS-9	X1234	SCREW			4
0500	11	1	PAOHH	- - -	MS-1234567890123 4567890	X1234	PRE-AMP			1
0500	11	2	PAOOO	9999-00-111-9999	MS-9	X1234	SCREW			4
0500	11	3	PAFHH	2222-00-888-2111	CB-1	X1234	BOARD-1	PBB	EA	1
0500	11	4	PAFHH	5555-66-777-8888	CB-2	X1234	BOARD-2			4
0500	12	2	PAHHH	- - -	RES-1	X1234	RESISTOR			5
0500	12	3	PAHHH	9999-88-777-6666	CAP-1	X1234	CAPACITOR			6
0500	12	4	PAHHH	- - -	TRS-1	X1234	TRANSISTOR			2
0500	12	5	PAHHH	3333-00-777-5111	DIO-1	X1234	DIODE			2
0500	13	1	PAFHH	5555-66-777-8848	CB-2	X1234	BOARD-2			4
0500	13	2	PAHHH	3333-00-777-5112	DIO-2	X1234	DIODE			3

FIGURE B-28. LSA-29 SUMMARY

Appendix B--Continued

LSA-30

LOGISTIC SUPPORT ANALYSIS RECORD

SPECIAL TOOLS LIST

FOR ALL LEVELS OF MAINTENANCE

TM TM-34P

DATE 11/10/76 PAGE 0001

END ITEM ACRINYM	LSA CONTROL NUMBER	MFR PART NUMBER	FSCM	ITEM NAME	SERVICE DESIGNATION
	1	XM-1234	X1234	WEAPON SYSTEM	ARMY

GROUP CODE	ILLUSTRATION FIGURE NO.	ILLUSTRATION ITEM NO.	SMR CODE	NATIONAL STOCK NUMBER	PART NUMBER	FSCM	ITEM NAME	USABLE ON CODE	U/M	QTY PER ASSY
9800	206	1	PADFD	5500-00-123-4567	PSE-1	X1234	ENGINE DIAGNOSER	PAA PBB,PCC	EA	1
							BOI: AUTH PER LETTERED COMPANY AUTH PER NUMBERED BATTERY/CO AND SIMILAR HQ PERFORMING ORG MAINT FOR OTHER UNITS			
9800	202	1	PADFF	- - -	PSF-3	X3333	SPECIAL TOOL-1	PAA	EA	1
							BOI: 1AUTH FOR 1-5	EQUIP		
							2AUTH FOR 6-15	EQUIP		
							3AUTH FOR 16-30	EQUIP		
							4AUTH FOR ABOVE 30	EQUIP		
							AUTH PER BN HQ WHEN BN HAS A SVC COMPANY			
9800	203	1	PADFF	5502-00-321-7654	PSE-4	X4444	SPECIAL TOOL-2	PAA	EA	1
							BOI: 2AUTH FOR 1-10	EQUIP		
							4AUTH FOR 11-20	EQUIP		
							5AUTH FOR ABOVE 20	EQUIP		
							AUTH PER HQ OF UNITS ABOVE BN LEVEL			
9800	204	1	PADFD	5510-00-123-4563	PSF-5	X1111	CRANE	PAA	EA	1
							BOI: 12345AUTH FOR 5-10	PBB EQUIP		
							AUTH PER LETTERED COMPANY			
9800	205	1	PAFFF	5506-00-123-3214	PSE-6	X1111	CALIBRATOR	PAA	EA	1
							BOI: 10AUTH FOR 1-5	PBB EQUIP		
9800	207	1	PAHHH	5502-00-654-6543	PSF-8	X1111	HANDLING DEVICE	PAA	EA	1
9800	208	1	PAHHD	5502-00-333-4444	PSE-9	X1111	WHEEL PULLER	PAA	EA	1
							BOI: AUTH PER LETTERED COMPANY			
9800	209	1	PAHDD	5505-00-444-5555	PSE-91	X1111	TMDE-1	PAA	EA	1

FIGURE B-29. LSA-30 SUMMARY

LSA-31

LOGISTIC SUPPORT ANALYSIS RECORD

NATIONAL STOCK NUMBER AND PART NUMBER INDEX

FOR ALL LEVELS MAINTENANCE

TM TM-34P

DATE 11/10/76 PAGE 003

END ITEM ACRONYM	LSA CONTROL NUMBER	MFR PART NUMBER	FSCM	ITEM NAME	SERVICE DESIGNATION
	1	XM-1234	X1234	WEAPON SYSTEM	ARMY

PART NUMBER	FSCM	FIGURE NO.	ITEM NO.
ACT-1	X1234	20	6
ACT-2	X1234	20	10
BELT-1	X1234	3	14
BELT-1	X1234	17	2
CAP-1	X1234	12	3
CB-1	X1234	11	3
CB-2	X1234	11	4
CB-2	X1234	13	1
CB-2	X1234	15	6
CB-3	X1234	16	2
CB-4	X1234	16	3
CB-5	X1234	15	2
COIL-1	X1234	15	4
DIU-1	X1234	12	5
DIU-2	X1234	13	2
DIU-2	X1234	15	3
G-1	X1234	6	6
G-1	X1234	9	5
G-2	X1234	6	7
G-2	X1234	9	6
G-3	X1234	9	7
G-4	X1234	7	7
G-4	X1234	8	6
G-5	X1234	7	8
GR-1	X1234	6	4
GSK-1	X1234	3	5
GSK-1	X1234	4	5
GSK-2	X1234	3	17
GSK-2	X1234	17	5
GSK-3	X1234	17	9
GSK-3	X1234	18	3
GSK-4	X1234	17	15
GSK-4	X1234	20	5
GSK-5	X1234	20	8
GSK-6	X1234	20	12
H-1	X1234	6	8
H-2	X1234	9	4
H-3	X1234	3	12
H-3	X1234	10	6
H-4	X1234	18	6

FIGURE B-30. LSA-31 SUMMARY

Appendix B--Continued

ALPHA PROVISIONING DATA ALPHA CARD FORMAT

```
OCCNNOPIIN/SPIIN-NUMBER  TEST END ITEM                    X1234000017610281
OCCNNOAAAA  BX1234SYSTEM-1PN        11SYSTEM-1              100001EAPAOMD      01A
OCCNNOAAAA   X1234MS-8888           22                                         03A
OCCNNOAAAA   X1234DN-SYSTEM-1PN     G1                                         05A
OCCNNOAAAA   30011FRDMTRCO11111678A51                                          07A
OCCNNOAAAA   3001190111             B                                          08A
OCCNNOAAAA     1111009991111    PAA,      0004500012001 18000000061000100007501B
OCCNNOAAAA                      PBB,PCC                                        02B
OCCNNOAAAA  REF-DESIG-SYSTEM-1PN               AA C H   0000000VRHAUL-CAND     01C
OCCNNOAAAA            10  6525  09511CMT125C9W                                 01D
OCCNNOAAAA  DCN-55          TM250        SUB        01     000015001500        01E
OCCNNOAAAA       TM-XXX-XXXX-XX-20P  011   2   10100                           01G
OCCNNOAAAA       TM-34P              011   3   1                               02G
OCCNNOAAAA       TA-XXX-XXXX-XX-20P        3   1                               03G
OCCNNOAAAA       TM-34P                    4   1                               04G
OCCNNOAAAA        065025005   005                        021                   01J
OCCNNOAAAD  CX1234MS-1              11NUT                   600014HDPAOZ2      01A
OCCNNOAAAD   X1234MS-7777           22                                         03A
OCCNNOAAAD   X1234DN-MS-1           G1                                         05A
OCCNNOAAAD   21291JCARTRPEANTS-1    52                                         07A
OCCNNOAAAD     9999001119991    PAA,      0000010000023 02000000000200100011001B
OCCNNOAAAD                      PBB                                            02B
OCCNNOAAAD  REF-DESIG-MS-1                     AU    U    0028  MTSP-ALL-TST   01C
OCCNNOAAAD  AAAA      00000000000099MMC113C9                                   01D
OCCNNOAAAD  DCN-54          TW200        SUB        06     001000027000        01E
UCCNNOAAAD       TM-XXX-XXXX-XX-20P  014   2   20100                           01G
OCCNNOAAAD       TM-34P              024   3   2                               02G
UCCNNOAAAD       TM-XXX-XXXX-XX-20P        3   2                               03G
OCCNNOAAAD       TM-34P              024   4   2                               04G
OCCNNOAAAD        000000000000000              000000000000                    01J
OCCNNOAAAG  CX1234MS-2              WASHER                  600010  PAOOO      01A
OCCNNOAAAG     9999001119992            000000000000  00             00000001B
OCCNNOAAAG                                        0029                         01C
OCCNNOAAAG  AAAA      0000000000000                                            01D
OCCNNOAAAG       TM-XXX-XXXX-XX-20P        2   30100                           01G
OCCNNOAAAG       TM-34P                    3   3                               02G
OCCNNOAAAG       TM-XXX-XXXX-XX-20P        3   3                               03G
OCCNNOAAAG       TM-34P                    4   3                               04G
OCCNNOAAAG        000000000000000              000000000000                    01J
OCCNNOAAAK  CX1234MS-3              BOLT                    400010  PAOOO      01A
OCCNNOAAAK     9999001119993            000000000000  00             00000001B
OCCNNOAAAK                                        0030                         01C
OCCNNOAAAK  AAAA      0000000000000                                            01D
UCCNNOAAAK       TM-XXX-XXXX-XX-20P        2   40100                           01G
OCCNNOAAAK       TM-34P                    3   4                               02G
UCCNNOAAAK       TM-XXX-XXXX-XX-20P        3   4                               03G
UCCNNOAAAK       TM-34P                    4   4                               04G
OCCNNOAAAK        000000000000000              000000000000                    01J
OCCNNOAAAN  CX1234GSK-1             GASKET                  100001  PAOOO      01A
OCCNNOAAAN     6666004447111            000000000000  00             00000001B
OCCNNOAAAN                                        0031                         01C
OCCNNOAAAN  AAAA      0000000000000                                            01D
UCCNNOAAAN       TM-XXX-XXXX-XX-20P        2   50100                           01G
OCCNNOAAAN       TM-34P                    3   5                               02G
OCCNNOAAAN       TM-XXX-XXXX-XX-20P        3   5                               03G
OCCNNOAAAN       TM-34P                    4   5                               04G
OCCNNOAAAN        000000000000000              000000000000                    01J
OCCNNOAAAR  CX1234SEAL-4            SEAL                    100001  PAOOO      01A
OCCNNOAAAR                              000000000000  00             00000001B
OCCNNOAAAR                                        0032                         01C
```

FIGURE B-31. LSA-36 SUMMARY

LSA-50 LOGISTIC SUPPORT ANALYSIS RECORD DATE 11/10/76 PAGE 005

LSA CONTROL NUMBER MASTER FILE PRINTOUT

LSA CONTROL NUMBER	TASK CODE	PART NUMBER	CARD NUMB			
		INPUT-DRIVE-PART	D7	YINPUT DRIVE	10	
10110A			A1	00000 DCDIN 0000IDA-1	000000ID-ASSEMBLY-1 X1234	00000
	HGFHMYA		C4C04A00025Y0000000010000100	63C30	01000000010000100	000
			D4	REMOVE AND REPLACE INP DRIVE ASSY-1		
		CSE-1	D7	KWRENCH	10	
		CSE-2	D7	KSOCKET	10	
		IDA-1	D7	YID-AWSEMBLY-1	10	
		MS-4	D7	YNUT	6	
		MS-5	D7	YWASHER	6	
	JGFHMYA		C4C04B00010M0000000005000100	63C30	M01000000005000100	000
			D4	REPAIR CRACKED HOUSING ON INP DR ASSY-1		
		CSE-1	D7	KWRENCH	10	
		CSE-2	D7	KSOCKET	10	
		H1	D7	YHOUSING	3	
10110A3			A1	00000 EWE2Y 0000GB-1	000000ID-GEAR BOX X1234DN-GB-1	X1234
	HGHDDYA		C4C04A00015R0000000010000000	63C40	01000000010000000	000
			D4	REMOVE AND REPLACE INPUT DRIVE GEAR BOX		
		CSE-1	D7	KWRENCH	10	
		CSE-2	D7	KSOCKET	10	
		CSE-3	D7	KSCREWDRIVER	10	
		GB-1	D7	YID-GEAR BOX	10	
	JGHDDYA		C4C04B00015S0000000020000000	63C40	M01000000020000000	000
			D4	REPAIR INPUT DRIVE GEAR BOX	1	

FIGURE B-32. LSA-50 SUMMARY

Appendix B--Continued

LSA-51 LOGISTIC SUPPORT ANALYSIS RECORD DATE 11/10/76 PAGE 21

LSA PARTS MASTER FILE PRINTOUT

PART NUMBER	LSA CONTROL NUMBER	CARD NUMB		
		H2H02AMS-PSE-8	711234510MTR0000100000001	
	19808	H3 PAMHH 000008000008222222WC	1REMARKS-7 0077	00000005 75 20
		H5H08APAA		
		H6H09ATM-XXX-XXXX-XX-20P 011 107 19800		
		H6H09BTM-34P 021 207 1		
PSE-9		H1 F3X1111WHEEL PULLER 100001JDA5J03EA000010		550200
		3334444 H4PH0800040040040040100 XXX 1 A		A300
		H2H02AMS-PSE-9	721234505 YT0000005000001	
		H2H02BDN-PSE-9	G166666 0000000000000	
	19809	H3 PAHHD 000009000009333333 C	1REMARKS-8 0078	00000025 601005
		H5H08APAA		
		H6H09ATM-XXX-XXXX-XX-20P 011 108 19800		
		H6H09BTM-34P 021 208 1		
PSE-91		H1 G1X1111TMDE-1 200001KDB6K02EA000015		550500
		4445555 J5 J0900050050050050 100 XXX		
		H2H02AMS-PSE-91	731234510XHC0000060000001	
	19810	H3 PAMDD 000010000010012 3AWC	1REMARKS-9 0079	00000015 6035
		H4H07A 000REF-DESTG-PSE-91	AZ	
		H5H08APAA		
		H6H09ATM-XXX-XXXX-XX-20P 011 109 19800		
		H6H09BTM-34P 021 209 1		
PSE-92		H1 12X1111TMDE-2 200001LDB7L07EA000020		550500
		6665555 K6PKI00006006006006 100 XXX		
	19811	H3 PADDD 000011000011BC456 C	1REMARKS-10 0080	00000010 7515

FIGURE B-33. LSA-51 SUMMARY

LSA-100 LOGISTIC SUPPORT ANALYSIS RECORD DATE 11/10/76 PAGE 002

INPUT TRANSACTION LIST

INPUT TRANSACTION IMAGE

```
        1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
D07 102102      HGFHHYACSE-6                                                    D
D07 102102      HGFHHYAPSE-91          B                                        C
D07 102103      BGHDDYAPSE-91                                                   R
D07 1022021     BGHDDYAPSE 91                                                   D
D07 10310       HGFHHYAMS-4             NUT, HEX              4                 C
D07 10310       HGOFFAABOBS-REJ         QTYCK              10 0                 A
D07 10310       HGOFFAAMS-8                                   2                 A
D07 10310       HGOFFAASEAL-18          QSEALANT             40                 A
D04 10310       JGOFFABREMOVE AND REPLACE PULLEY              1                 A
D07 1031034     JGHDDYARP-2                                   1                 C
A01 104         TESTDAAX1234A WD1Y1          SUB       760801                   A
A02 104         SYSTEM-4                                                        A
A03A104         SYSTEM-4PN        X1234DW-SYSTEM-4PN    X1234                   A
A04 104         001000H010000M000200C000200200000005H                           A
H02AACT-1            TEST-ADD                                                   A
H02AACT-1            TEST-DELET                                                 D
H02BACT-1            TEST-ADD-2                                                 A
H02BACT-1            TEST-CHANGE                                                C
H04AACT-3       .       1    1    5                                            A
H08AACT-3            104101      ABC,DEF                                       A
H01ABELT-1             X1234V-BELT-14X          Y    1                         C
H01ABELT-1             X1234BFLT                Y    1                         D
H02ABELT-1           TEST-ADD                                                   A
H02ABELT-1           TEST-REMOVE                                                R
H02BBELT-1           TEST-ADD                                                   A
H02CBELT-1           TEST-ADD                                                   A
H01ADIO-1                  DIOD                                                C
H01ADIO-1                  DIO                                                 C
H01ADIO-2                  DIOD                                                C
H01ADIO-2                                                                      D
H05 MS-2             10102                                                     R
H05 MS-4             1011081                                                   R
H07 MS-7             10302                                                     R
H03 PP-1             8010-XX-387-XXXX                                          A
H04APSE-1              17                                                      A
H07APSE-1            19801       YAAA  001STUVABCDEFGHIJKLMNOPQR               A
```

SORT KEY

```
        1         2         3         4
12345678901234567890123456789012345678901234567
102102      HGFHHYACSE-6              D7    D07 D
102102      HGFHHYAPSE-91             D7    D07 C
102103      BGHDDYAPSE-91             D7    D07 R
1022021     BGHDDYAPSE 91             D7    D07 D
10310       HGFHHYAMS-4               D7    D07 C
10310       HGOFFAABOBS-REJ           D7    D07 A
10310       HGOFFAAMS-8               D7    D07 A
10310       HGOFFAASEAL-18            D7    D07 A
10310       JGOFFAB                   D4    D04 A
1031034     JGHDDYARP-2               D7    D07 C
104                                   A1    A01 A
104                                   A1    A02 A
104                                   A1    A03AA
104                                   A4    A04 A
ACT-1                        H2H02AH02AA
ACT-1                        H2H02AH02AD
ACT-1                        H2H02BH02BA
ACT-1                        H2H02BH02BC
ACT-3                        H1    H04AA
ACT-3                 104101 H5H08AH08AA
BELT-1                       H1    H01AC
BELT-1                       H1    H01AD
BELT-1                       H2H02AH02AA
BELT-1                       H2H02AH02AR
BELT-1                       H2H02BH02BA
BELT-1                       H2H02CH02CA
DIO-1                        H1    H01AC
DIO-1                        H1    H01AC
DIO-2                        H1    H01AC
DIO-2                        H1    H01AD
MS-2                  10102  H3    H05 R
MS-4                  1011081 H3   H05 R
MS-7                  10302  H4H07 H07 R
PP-1                         H1    H03 A
PSE-1                        H1    H04AA
PSE-1                 19801  H4H07AH07AA
```

FIGURE B-34. LSA-100 SUMMARY

LSA-101 LOGISTIC SUPPORT ANALYSIS RECORD DATE 11/10/76 PAGE 1

EDIT REJECTION LIST

INPUT TRANSACTION LIST								ERROR REASON
1	2	3	4	5	6	7	8	
12345678901234567890123456789012345678901234567890123456789012345678901234567890								
D07 10310	HGOFFAABOBS-REJ		QTYCK		10 0		A	D07 N FIELD NOT NUMERIC.
H07APSE-6	19806		001 NOTLEFTJUSTIFIED				A	H07AF FIELD NOT LEFT JUSTIFIED.
H04APSE-95	99999999999999999999999999999999999999999999999999						A	H04AE FIELD IS NOT A THRU H.
								H04AH FIELD IS NOT A THRU H.
								H04AK FIELD IS NOT A THRU H.

FIGURE B-35. LSA-101 SUMMARY

LSA-102

LOGISTIC SUPPORT ANALYSIS RECORD

DATE 11/10/76 PAGE 1

VALID FGC UPDATE LIST

TRANSACTION IMAGE

```
                1         2         3         4         5         6         7         8
1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678900
A01 02                                                                                    D
A02 02                                                                                    D
A04 03              010000M        000000000000003H                                       A
C04A08         HGOXXYA     H00200           Y 63C20  A0100200            020C            C
D04 08         HGOXXYAREMOVE AND REPLACE TEST2                                           A
A01 1          XM-TD AX1235  C              SUB-ASS-4 760801                             C
A02 1                             TEST-SYSTEM-1                                         C
A04 1          001500H       000250C      250                                          C
A08 1          000500                                                                   C
A09 1          001000                                                                   C
C04L1          AEFFFBA00000 000000000000000          0000000000000000000 000           A
C04B1          AEOFFBA                        63C40                                     C
C04H1          CBCOOAA                                                                  D
C04A1          HGOXXYA00200H001000015000000  63C30  A020000000021000000  000N        A
C04E1          KRDDDAA           07500                                          200     C
C04F1          KRDDDAA                        WG08           03000                      C
A04 101                                                                                  D
D04 10110      HGOFFAAREMOVE AND REPLACE INPUT DRIVE ASSY-4                              C
A01 10110A                 06                                                            R
D04 10120      HGOFFAA                                                                   D
A04 102                    03                                                            P
C04A102        HGOFFAA                                  01     00100                     C
C04C102        HGOFFAA00200 000000010000000  63C40  A010000000005000000  000         A
C04A10210      HGOFFAA                                                                   R
```

FIGURE B-36. LSA-102 SUMMARY

Appendix B--Continued

```
LSA-103                              LOGISTIC SUPPORT ANALYSIS RECORD                    DATE 11/10/76    PAGE    1
                                          REJECTED FGC UPDATE LIST

                       TRANSACTION IMAGE                                                          ERROR REASON
            1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890

A01 03         TEST11NX1234A W  100      200       760801                   A    0008 REC ON MASTER--CODE SHOULD BE C
A02 03         TEST-SYSTEM       T-1                        0100            A    0008 REC ON MASTFR--CODE SHOULD BE C
A03A03                          X12340-NO-1         X4321                   A    0008 REC ON MASTFR--CODE SHOULD BE C
A01 07         TEST11                              760801                   C    0003 RECORD NOT ON MASTER---CODE MUST BE A
A02 07         TEST-SUB-SYSTEM                                              C    0003 RECORD NOT ON MASTER---CODE MUST BE A
A04 07         001500H                                                      C    0003 RECORD NOT ON MASTER---CODE MUST BE A
C04A1          AACOOBA                                               010    A    0008 REC ON MASTER--CODE SHOULD BE C
A02 101                                                                     R    0001 INVALID REMOVE CARD
D04 10110      DGOFFAAADJUST INPUT DRIVE ASSEMBLY                           A    0008 REC ON MASTFR--CODE SHOULD BE C
D04 10110A3    HGHDDYA                                                      R    0003 RECORD NOT ON MASTER---CODE MUST BE A
D04 10120      JGFMMYA                                                      R    0001 INVALID REMOVE CARD
D04 10120      JGHXXAA                                                      D    0003 RECORD NOT ON MASTER---CODE MUST BE A
D07 102103     BGHDDYAPSE-91                                                R    0001 INVALID REMOVE CARD
D07 1022021    BGHDDYAPSE 91                                                D    0003 RECORD NOT ON MASTER---CODE MUST BE A
D07 10310      HGFMMYAMS-4            NUT, HEX                  4           C    0003 RECORD NOT ON MASTER---CODE MUST BE A
D07 10310      HGOFFAAMS-8                                      2           A    0008 REC ON MASTFR--CODE SHOULD BE C
```

FIGURE B-37. LSA-103 SUMMARY

LSA-104 LOGISTIC SUPPORT ANALYSIS RECORD DATE 11/10/76 PAGE 1

VALID PARTS UPDATE LIST

TRANSACTION IMAGE

```
          1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
H02AACT-1          TEST-DELET                                                    D
H02BACT-1          TEST-CHANGE                                                   C
H04AACT-3             1  1  5                                  000               A
H08AACT-3          104101     ABC,DEF                                           A
H01ABELT-1           X1234V-BELT-14X          Y00001                           C
H01ABELT-1           X1234BELT                Y00001                           D
H02ABELT-1         TEST-REMOVE                                                   R
H02BBELT-1         TEST-ADD                                  0000000000000     A
H02CBELT-1         TEST-ADD                                  0000000000000     A
H01ADIO-1                DIOD                                                  C
H01ADIO-1                DIO                                                   C
H01ADIO-2                DIOD                                                  C
H01ADIO-2                                                                      D
H05 MS-2           10102                                                       R
H05 MS-4           1011081                                                     R
H04APSE-2             2                                                        C
H02APSE-2          MM-PSE-2                                                    C
H01BPSE-4                          001800060007                                C
H01BPSE-4                                                                      D
H07BPSE-4          19804           000GHIJKLMNOPORSTUVWXYZ012345678901          A
H07BPSE-5          19805     YAAA  002TESTNOH07A                                A
H04APSE-6                                                                      D
H07 PSE-92         19811                                                       R
H04APSE-95                                                 000                 A
```

FIGURE B-38. LSA-104 SUMMARY

Appendix B--Continued

LSA-105 LOGISTIC SUPPORT ANALYSIS RECORD DATE 11/10/76 PAGE 1

REJECTED PARTS UPDATE LIST

TRANSACTION IMAGE								ERROR REASON
1	2	3	4	5	6	7	8	
12345678901234567890123456789012345678901234567890123456789012345678901234567890								
H02AACT-1	TEST-ADD						A	0008 REC ON MASTER--CODE SHOULD BE C
H02BACT-1	TEST-ADD-2						A	0008 REC ON MASTER--CODE SHOULD BE C
H02ABELT-1	TEST-ADD						A	0008 REC ON MASTER--CODE SHOULD BE C
H07 MS-7	10302						R	0003 RECORD NOT ON MASTER--CODE MUST BE A
H03 PP-1	8010-XX-387-XXXX						A	0008 REC ON MASTER--CODE SHOULD BE C
H04APSE-1	17						A	0008 REC ON MASTER--CODE SHOULD BE C
H07APSE-1	19801	YAAA	001STUVABCDEFGHIJKLMNOPQR				A	0008 REC ON MASTER--CODE SHOULD BE C
H04APSE-100							C	0003 RECORD NOT ON MASTER--CODE MUST BE A
H07APSE-2	19802		001TUVWBCDEFGHIJKLMNOPQRS				A	0008 REC ON MASTER--CODE SHOULD BE C
H10APSE-2	199802						D	0003 RECORD NOT ON MASTER--CODE MUST BE A
H20APSE-2	199802						D	0003 RECORD NOT ON MASTER--CODE MUST BE A
H07APSE-3	19803		005KOL1A1B2C3D4E5F6G7H8J9				A	0008 REC ON MASTER--CODE SHOULD BE C
H07APSE-4	19804		001ABCDEFGHIJKLMNOPQRSTUVWXYZABCDEF				A	0008 REC ON MASTER--CODE SHOULD BE C
H07APSE-93	19821	XABC	001NOH3RECORD				A	0002 INVALID ADD--NO H1 HDR REC
H02APSE-95	TEST-ADD1						A	0004 ADD WITH DUPE SORT KEY FIELD
H10 PSE-96	19821						A	0002 INVALID ADD--NO H1 HDR REC
H20 PSE-97	19820						A	0002 INVALID ADD--NO H1 HDR REC
H01APUL-1	X1234PULLEY-1			Y00001			A	0008 REC ON MASTER--CODE SHOULD BE C
H09ASEAL-1	10203						R	0003 RECORD NOT ON MASTER--CODE MUST BE A
H09BSYSTEM-4PN	104	TM-XXX-XXXX-XX-34P			7	2	A	0002 INVALID ADD--NO H1 HDR REC

FIGURE B-39. LSA-105 SUMMARY

AD-A061 702 ARMY MATERIEL DEVELOPMENT AND READINESS COMMAND ALEX--ETC F/G 5/1
MAINTENANCE OF SUPPLIES AND EQUIPMENT, AMC GUIDE TO LOGISTIC SU--ETC(U)
JUN 75

UNCLASSIFIED DARCOM-P-750-16 NL

2 OF 3
AD
A061 702

LSA-106 LOGISTIC SUPPORT ANALYSIS RECORD DATE 11/10/76 PAGE 0001

FGC-PART NUMBER CROSS-REFERENCE ERROR LIST

THE FOLLOWING PART NUMBERS ARE CONTAINED ON THE FGC MASTER FILE, BUT ARE NOT CONTAINED ON THE PARTS MASTER FILE

PART NUMBER	RECORD TYPE		FGC	TASK CODE	PART NUMBER	RECORD TYPE		FGC	TASK CODE
CANT-FIND-IT	D7	08		HGOXXYA	HIGH-FIVE	A1	03		
MS-1234567890123	A1	10210			NO-HIT	A1	05		
NO-MATCH	A1	04			PART-NUMBER	A1	02		
SEAL-18	D7	10310		HGOFFAA	SYSTEM-4PN	A1	104		
WIPE-OUT	A1	06			1234567890	D7	08		HGOXXYA

FIGURE B-40. LSA-106 SUMMARY

LSA-107 LOGISTIC SUPPORT ANALYSIS RECORD DATE 11/10/76 PAGE 001

REJECTED SELECTION CARD LIST

SELECTION CARD IMAGE	ERROR CODES
01A1 2 3 4 5 6 01 S	NSS NOT NUMERIC
04A102 03	INVALID UPDATE CODE
04A 103 S	INVALID LCN
26A 101 S	INVALID LCN
02A101 03	INVALID UPDATE CODE
05 101 63C20 04 S	INVALID SDC
11A101 T20 03 S	INVALID SPEC PGMTS
02A101 S 03 S	INVALID SSE
03A101 03 S	INVALID ANL OPER REQ
26A102 03 S	INVALID TYPE LIST
09A102 03 S	NO ICC OR PLC
13A102 300 03 S	INVALID SUP EQUIP GP

FIGURE B-41. LSA-107 SUMMARY

LSA-108 LOGISTIC SUPPORT ANALYSIS RECORD DATE 11/10/76 PAGE 001

VALID SELECTION CARD LIST

SELECTION CARD IMAGE

```
         1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890
01A1                                                     01                  S
02A1                                                     01                  S
03A1          001000M                                    01                  S
04A1          ABCE12H45JKLX                              01                  S
05A1          KJL                                        01                  S
06A1          001004COFHGD                               01                  S
07A1          JKLM                                       01                  S
08A1          JKLM                                       01                  S
09A1          ABCD1234K   ABCDEF                         01                  S
10A1          ABCD1234K   ABCDEF                         01                  S
11A1          F                                          01                  S
11A1          T                                          01                  S
13A1                                                     01                  S
26A1          1B81XYZ                                    01                  S
26A1          2B81ABCD123                                01                  S
29A1          1B82XYZ                                    01                  S
29A1          2B82ABCD123                                01                  S
51A                                                                          S
50A                                                                          S
01A101        63C20                                      04                  S
```

FIGURE B-42. LSA-108 SUMMARY

Appendix B--Continued

(5) LSA-05, Support Item Utilization Summary. A summary, by item category code, of the use of the item by maintenance level and FGC/LSA Control Number. The report can be used to justify the requirement for support equipment and determine the quantity and distribution requirements. The summary can also be used to determine recommended order quantities of repair parts based on their total utilization. Format contained at Figure B-15.

(6) LSA-06, Critical Maintenance Task Summary. The summary provides a list of all maintenance tasks which exceed a specified value for task frequency, elapsed time, man-hours, and annual man-hours. The summary may be selected for any maintenance level or combination of levels. The summary can be used to pinpoint problem areas and plan maintenance for critical components. Format contained at Figure B-16.

(7) LSA-07, Support Item Requirements by Skill Specialty Code and Maintenance Category. A summary of all support equipment (i.e., tools, test equipment, etc.) utilized by Skill Specialty Code and category of maintenance. This summary can be used to develop tool kits for each skill specialty and level of maintenance. Format contained at Figure B-17.

(8) LSA-08, Support Item Requirements by Maintenance Category and Skill Specialty Code. A summary of all support items (i.e., tools, test equipment, etc.) utilized by maintenance category and Skill Specialty Code. This summary can be used to develop tool kits for each level of maintenance. Format contained at Figure B-18.

(9) LSA-09, Support Items List. A summary, by FGC/LSA Control Number, part number, and National Stock Number, of all the repair parts, tools, and/or test equipment necessary to support the system/equipment. The summary will provide the information necessary to perform provisioning. Format contained at Figure B-19.

(10) LSA-10, Support Items List. A summary by manufacturer's part number and National Stock Number, of all the repair parts, tools, and/or test equipment necessary to support the system/equipment. The report will provide the information necessary to perform provisioning. Format contained at Figure B-20.

(11) LSA-11, Special Training Device Requirements. A summary of all maintenance tasks which were identified as requiring a special training device. The report will provide the requirements and justification for the acquisition of training devices. Format contained at Figure B-21.

Appendix B--Continued

(12) LSA-12, Special Facility Requirements. A summary of all maintenance tasks which are identified as requiring new facilities. The report will provide requirements and justification for the construction of new facilities. Format contained at Figure B-22.

(13) LSA-13, Support Equipment Grouping Number Utilization Summary. A summary, by maintenance level and Support Equipment Grouping Identification Number, of the maintenance tasks which use the support equipment group. The report will provide the requirements, quantity, and justification for the acquisition of support equipment. Format contained at Figure B-23.

(14) LSA-20, Tool and Equipment Requirements. A summary of tools and equipment required by task function and maintenance category. This report is used to identify tools and equipment required to perform the maintenance functions listed on LSA-04, Maintenance Allocation Summary. The LSA-20 and LSA-04 listings are cross indexed by the "Tool or Test Equipment Reference Code." Format contained at Figure B-24.

(15) LSA-26, Repair Parts List. A summary of repair parts by FGC/LSA Control Number for each major subsystem. This list may be produced for each maintenance category or combination of maintenance categories. This report may be used as a draft repair parts and special tools list during the demonstration/evaluation test phases. Format contained at Figure B-25.

(16) LSA-27, Special Tools List. A summary of special tools by FGC/LSA Control Number for each major subsystem. This list may be produced for each maintenance level or combination of maintenance levels. This report may be used as a draft repair parts and special tools list during the demonstration/evaluation test phases. Format contained at Figure B-26.

(17) LSA-28, Cross Reference Indexes. The LSA-28 summary provides a National Stock Number, part number, and reference designation cross reference index to figure and item numbers. The report can be obtained for all maintenance levels. Format contained at Figure B-27.

(18) LSA-29, Repair Parts List. A summary of repair parts by TM Designation and figure and item number for each major subsystem. This list may be produced for each maintenance category based on TM Designation. Format contained at Figure B-28.

Appendix B--Continued

(19) LSA-30, Special Tools List. A summary of special tools by TM Designation and figure and item number. The list may be produced for each maintenance category based on TM Designation. Format contained at Figure B-29.

(20) LSA-31, Cross Reference Indexes. The LSA-31 summary provides a National Stock Number, part number, and reference designation cross reference index to figure and item numbers. The list may be produced for all maintenance levels based on TM Designation. Format contained at Figure B-30.

(21) LSA-36, Provisioning Requirements. The LSA-36 summary reformats the Data Sheet H information into exact ALPHA (AMC Logistic Program Hardcore Automated) format for the generation of Provisioning Technical Documentation. Utilization of this summary insures provisioning data are based on, and compatible with LSA data documented on the "A" through "G" data sheets. The ALPHA card format of the LSA-36 summary is contained at Figure B-31.

(22) LSA-50, LSA Control Number Master File Printout. A list of all "A", "C", and "D" card information which has been input to the data system. The report is listed by LSA Control Number, record type, and task code sequence. Format contained at Figure B-32.

(23) LSA-51, Parts Master File Printout. A list of all H-card information which has been validly input to the LSAR data system. The report is listed by part number, record type, and LSA Control Number sequence. Format contained at Figure B-33.

(24) LSA-100, Input Transaction List. A summary of all A, C, D, and H cards, in card image format, which were input to the system on a given run. The summary serves as a hardcopy record of the data input to the system on each run. Format contained at Figure B-34.

(25) LSA-101, Edit Rejection List. A summary of all A, C, D, and H cards rejected due to keypunch or format type errors and listed in card image format. Error reasons are provided for each rejected card listed. Format contained at Figure B-35.

(26) LSA-102, Valid FGC Update List. A card image listing of all A, C, and D cards which passed the edit and have been added to the LSA Control Number Master File. Format contained at Figure B-36.

Appendix B--Continued

(27) LSA-103, Rejected FGC Update List. A summary of all A, C, and D cards which passed the edit but were rejected due to logic errors; i.e., changing data that does not exist, adding a field which already exists, etc. Error reasons are provided for each card rejected. Format contained at Figure B-37.

(28) LSA-104, Valid Parts Update List. A card image listing of all H-cards which passed the edit and have been added to the Parts Master File. Format contained at Figure B-38.

(29) LSA-105, Rejected Parts Update List. A summary of all H-cards which passed the edit but were not added to the Master File due to logic errors in the input. Error reasons are provided for each card rejected. Format contained at Figure B-39.

(30) LSA-106, FGC-Part Number Cross Reference Error List. A summary list of all part numbers input to the LSA Control Number Master File which cannot be matched to part numbers on the Parts Master File. This report provides a list of part numbered items which have been identified by the maintenance task analysis but have not been identified by the provisioning process (i.e., Data Sheet H). Format contained at Figure B-40.

(31) LSA-107, Rejected Selection Card List. A summary list of all selection cards which were rejected due to keypunch or logic errors on the selection cards. Error reasons are provided for each rejected card. Format contained at Figure B-41.

(32) LSA-108, Valid Selection Card List. A summary report of all selection cards which passed the edit routine. Each valid selection card will generate one or more LSAR output reports. Format contained at Figure B-42.

e. Data generated during the LSA program shall be used to produce the applicable Data Item Description (DID) requirements listed on the Contract Data Requirements List (DD Form 1423). The Government computer programs can reduce the production of many DID's to an ADP extraction whose only cost is machine printout time. The following paragraphs are a description of how deliverable data may be obtained from the LSAR. These paragraphs shall not be construed as express or implied authorization to the contractor to provide these data. Authorization and requirements for deliverable data shall be only as listed on the DD Form 1423, attached to the contract.

Appendix B--Continued

(1) Maintenance Allocation Chart. The maintenance allocation chart (MAC), AR 310-3, may be produced directly from the Maintenance Allocation Summary (LSA-04) by using only the data necessary to satisfy the MAC format. Using these data to produce the MAC ensures that the maintenance task allocation is compatible with the equipment publications, tool and equipment allocations, repair parts lists, the maintenance plan, and the availability of skills and the manpower allocation. A separate MAC may be produced for any subsystem of the system/equipment (e.g., vehicle, communications, missile, etc.) specified by the Army MAC proponent. The LSA-20 format will provide the MAC's companion tool and equipment list.

(2) Equipment Publications.

(a) The LSAR contains technical information necessary for preparation of equipment publications. Use of LSAR data will eliminate the requirement for a separate analysis effort to provide this technical information. Also, the use of a common data base for equipment publications will assure compatibility between the repair part lists, support equipment and tool lists, task allocation, skills, and the operating and maintenance instructions.

(b) The "D" Data Sheet provides a step by step description of how each maintenance and operator task is performed (e.g., procedures, tolerance, alignment, qualifying notes, etc.). The "D" sheet task descriptions are sorted as shown in figure B-43 by major subsystem, maintenance level, and task function to put the narrative in TM sequence.

(c) The LSA-26, LSA-27, and LSA-28 output summaries provide early draft repair parts, special tools, and cross reference lists in the format specified by MIL-M-63001E. Once TM Designation has been input to the LSAR, then the LSA-29, LSA-30, and LSA-31 output summaries can be obtained and would serve as the draft listing portion of the repair parts and special tools list (RPSTL).

(3) Qualitative and Quantitative Personnel Requirement Information (QQPRI) Report. Qualitative and quantitative personnel requirements information is specified as a responsibility of the materiel developer in Chapter 3, Section II of AR 611-1. A QQPRI report may be prepared for any subsystem (e.g., vehicle, communication, missile, etc.) within the system/equipment. Data requirements for the QQPRI report and logic for obtaining the QQPRI report from the LSAR is as follows:

(a) Identify the DA-approved statement of requirement or procurement directive (e.g., ROC, TDR, PIP, etc.) for the end item. This would be prepared by the Army. Figure B-44 is a suggested format for capturing this data.

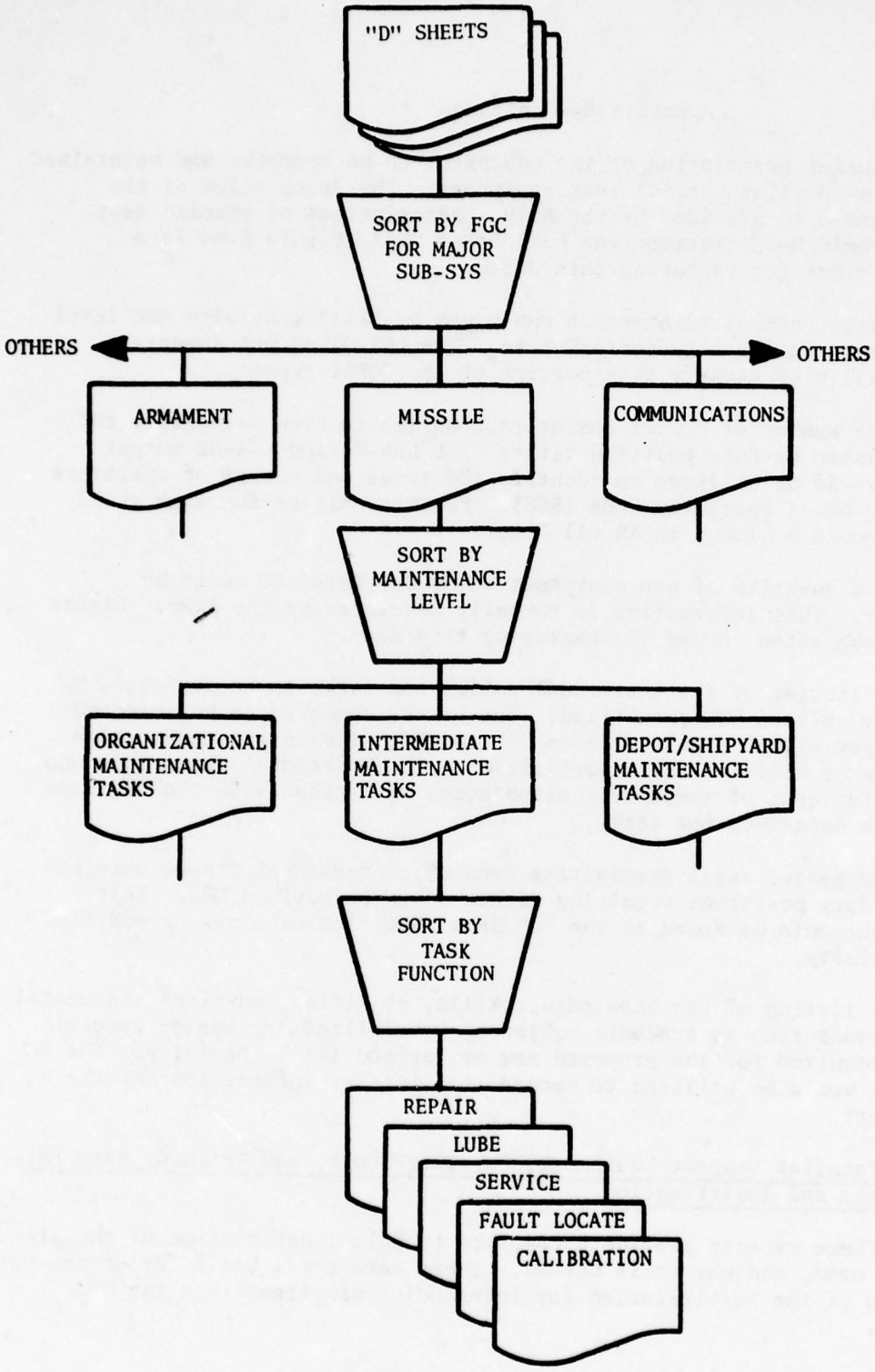


FIGURE B-43. LOGIC FOR NARRATIVE TM DATA

(b) A brief description of the equipment to be operated and maintained to include supporting special test equipment. The description of the equipment would be provided by the Army. Descriptions of special test equipment would be extracted from Data Sheet "E." Figure B-44 is a suggested format for capturing this data.

(c) Direct annual maintenance man-hours by skill specialty and level of maintenance for each system/end item. The LSA-01 output summary (Figure B-11) will satisfy this portion of the QQPRI report.

(d) The number of direct operators required to crew or operate the end item/system by duty position title. The LSA-01 and LSA-02 output summaries would be utilized to identify the types and number of operators required by Skill Specialty Code (SSC). Position titles for each skill specialty would be found in AR 611-201.

(e) The quantity of new equipment to be delivered to units by fiscal year. This information is normally developed by the Army. Figure B-44 is a suggested format for capturing this data.

(f) A listing of the individual duties and tasks to be performed by each new or revised SSC identified. The LSA-02 summary can be selected by Skill Specialty Evaluation Codes "E" and "M," indicating tasks which require new or modified skill specialties. The Functional Group Code and task code for each of these evaluation codes is matched with the "D" Data Sheet which describes the task.

(g) Suggested skill specialties from which personnel can be obtained for those duty positions requiring either a new or revised MOS. This information would be found on the "G" Data Sheet for each new or modified skill specialty.

(h) A listing of the knowledge, skills, abilities, physical and mental qualifications such as academic subjects, specialized degrees or special licenses required for the proposed new or revised skill specialty. The "G" Data Sheet would be utilized to record this type of information for the QQPRI report.

(4) Peculiar Support Equipment, Peculiar Tools, and Training Material Requirements and Justification.

(a) These reports provide a complete technical description of the item, how it is used, and why it is needed. These data are a basis for Government evaluation of the justification for introducing new items into the DOD inventory.

QQPRI REPORT-PART I

FGC/WBS/WUC | End Item Acronymn Code | Serial Number Effectivity FROM TO | Contract Control No

Item Name | National Stock Number | Date YR MO DA

1. DESCRIPTION OF EQUIPMENT TO BE OPERATED AND MAINTAINED:

2. REQUIREMENTS DOCUMENT NUMBER:

3. ANNUAL OPERATING REQUIREMENTS:

4. QUANTITY OF EQUIPMENT TO BE DELIVERED TO UNITS BY FISCAL YEAR:

(a) UNIT	(b) YEAR	(c) QTY	(d) FLOAT FACTOR	(e) ATTRITION FACTOR	(f) POINT IN TIME THAT ATTRITION FACTOR WILL BE APPLIED:
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					

5. MOS's QUALIFIED OR PROJECTED TO BE QUALIFIED DURING THE DEVELOPMENT PHASE:

(a) MOS	(b) QTY	(a) • MOS	(b) QTY
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

NOTE: ATTACH TO THIS REPORT THE POI'S USED TO QUALIFY MILITARY PERSONNEL FOR TEST AND EVALUATION. ALSO, ASSURE THAT POI'S INCLUDE THE NAME OF TRAINING ACTIVITY (CONTRACTOR), TITLE OF COURSE, LENGTH OF COURSE, DUTY POSITIONS FOR WHICH COURSE TRAINS, AND PREREQUISITES REQUIRED FOR ATTENDANCE.

FIGURE B-44. PART I, QQPRI REPORT SUMMARY

(b) The logic for extracting this information from the LSAR is shown in Figure B-45. The report will include all "E" Data Sheets, the LSA-05, and LSA-11 output summaries and the "D" Data Sheets which describe the tasks to which the peculiar items and training material are related.

(5) Facility Design Criteria

(a) Facility Design Criteria are used to identify specific technical requirements upon which the facility design is predicated. These requirements include the facilities required for testing, training personnel, and field and depot maintenance. These criteria are used to describe the work activities that will take place in the facility, the design features, and utility requirements. This information is also needed for developing plans and budget estimates for the Military Construction Program and other facilities funding areas.

(b) Include in this report the LSA-12 output summary and a copy of each "F" Data Sheet which describes the facility design requirements and those maintenance tasks which generated a need for new facilities. Any sketches or other supplementary material which were included in the hardcopy storage may be retrieved for backup information. Also, include the "D" Data Sheets which describe the tasks to be performed in the new facility.

(6) Provisioning Requirements.

(a) The LSA-36 output summary can be selected for any indenture level. The Provisioning Contract Control Number (PCCN), Procurement Instrument Identification (PII), nomenclature, control data, prime FSCM, submission control code, and date of list are input, along with the particular LSA Control Number, item category code(s) and provisioning list category code(s) for which the report is required. The computer program can assign Provisioning List Item Sequence Number (PLISN), next higher assembly PLISN, same as PLISN, and indenture codes as an option. Assignment is based on the structure of the LSA Control Number which must also be input.

(b) The LSA-36 report may be punched on cards (Figure B-31), printed on computer paper (Figure B-46), or output on magnetic tape. The specific requirements for contractual delivery of Provisioning Technical Documentation (PTD) shall be in accordance with the DD Form 1949-1 or procuring activity instructions. The user can select any combination of the output modes identified.

(c) The LSA-36 corresponds line by line to the MIL-STD-1552 output format and the selection worksheet DARCOM Form 1731 (March 1976) format. The output provided is shown by the "filled" blocks in Figure B-46. The LSA-36 report provides all PTD required by MIL-STD-1552.

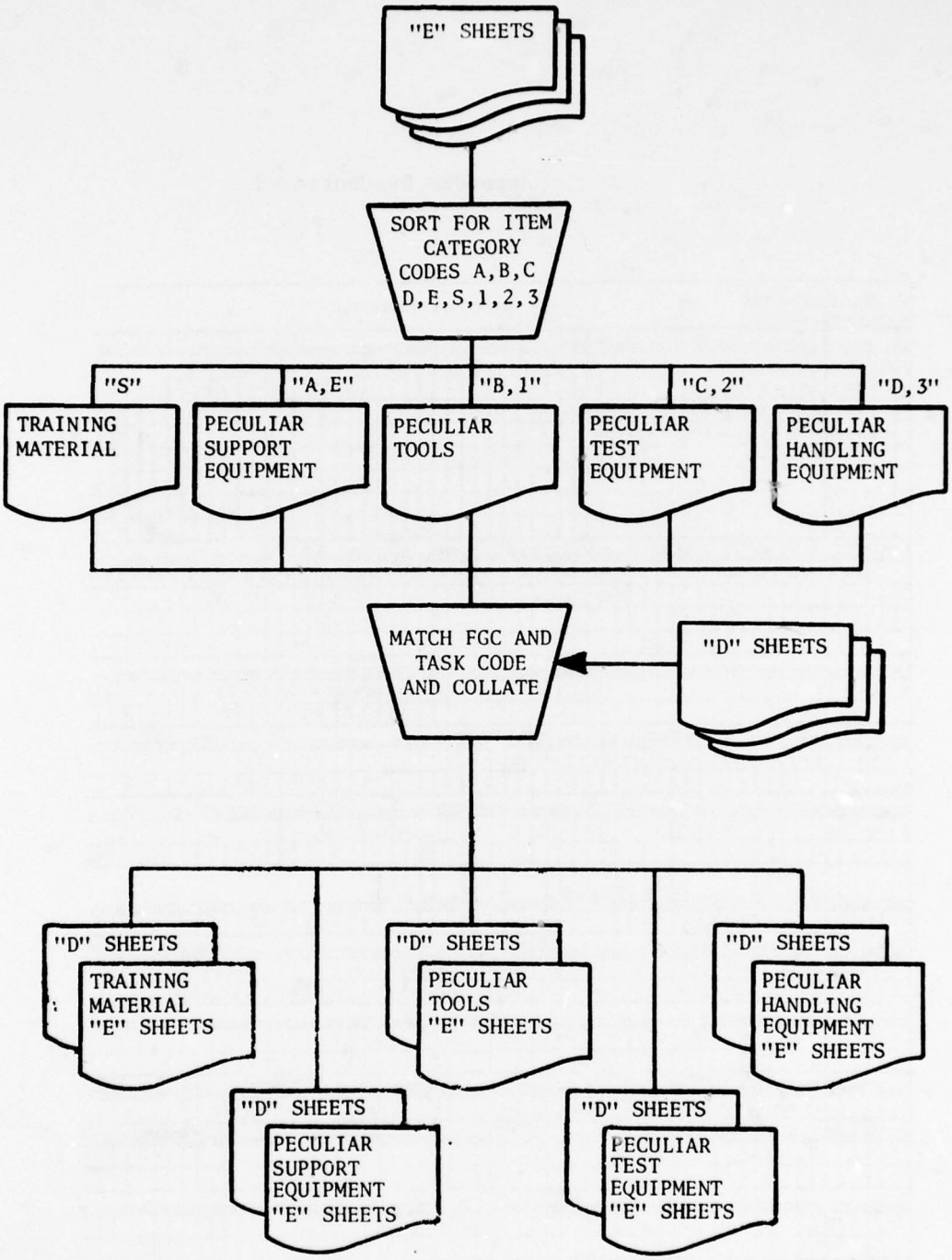


FIGURE B-45. LOGIC FOR PECULIAR REQUIREMENTS

Appendix B--Continued

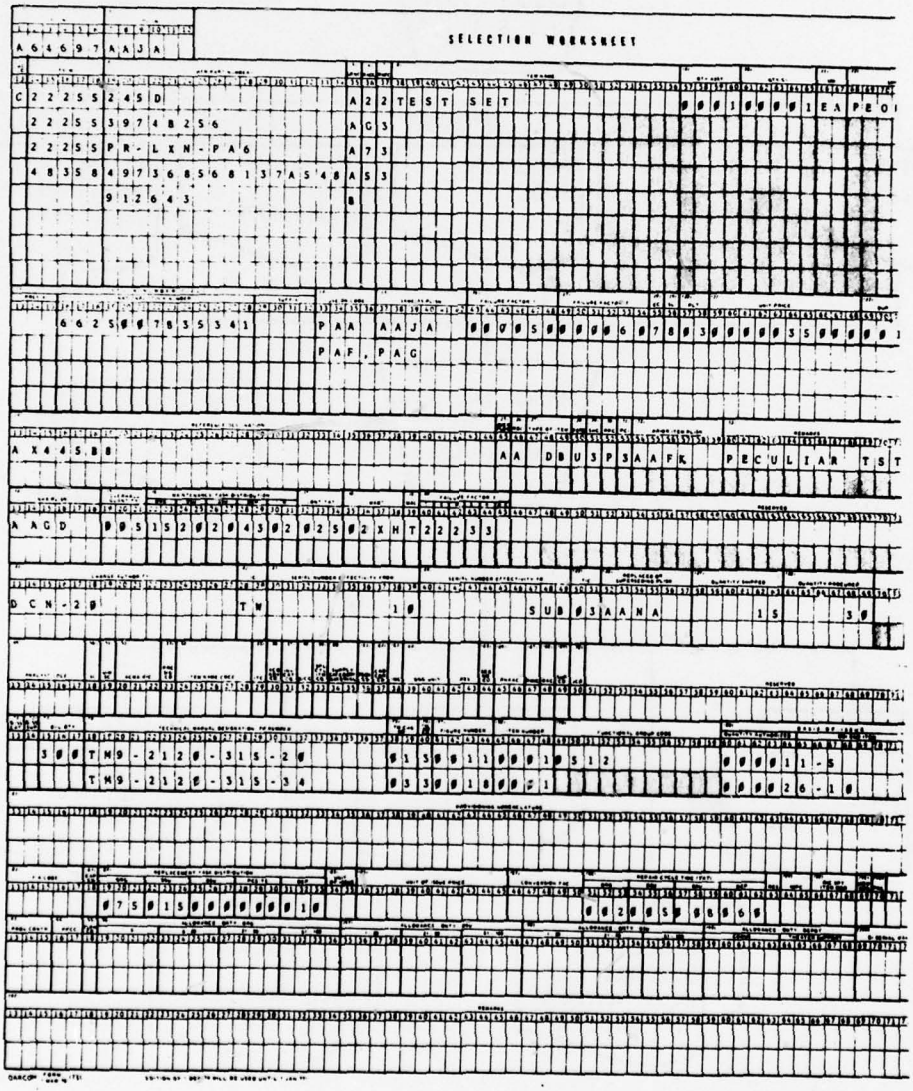


FIGURE B-46. SELECTION WORKSHEET

Appendix B--Continued

5. Detailed Data Entry Instructions.

a. General. This section provides detailed instructions for filling out input data sheets. The instructions for completing each data sheet are addressed by card and block number, data element title and number, field length, and type character. Definition of terms and the standard data element dictionary are in paragraph B-6.

b. Data Sheet A, Operations and Maintenance Requirements.

Card AØ1, Block 1. Functional Group Code/Work Breakdown Structure/ Work Unit Code (FGC/WBS/WUC), DED 054, 224, 225, 11X. Enter the FGC/WBS/ WUC for which the sheet is being prepared. This code is the basic indexing key and should be assigned with extreme care. See paragraph B-3c for detailed instructions on establishing this code. The FGC/WBS/WUC appears on every card on the "A" through "G" data sheets and on cards HØ5 through H2Ø.

Card AØ1, Block 2. End Item Acronym Code, DED 033, 6X. Enter the code assigned by the procuring activity.

Card AØ1, Block 3. Service Designator Code, DED 166, 1A. Enter the code for the military service which is managing the acquisition program.

Card AØ1, Block 4. Federal Supply Code for Manufacturers (FSCM), DED 051, 5X. Enter the code for the manufacturer of the end item.

Card AØ1, Block 5. Alternative Action Code, DED 005, 1A. This code is used to distinguish between maintenance alternatives if more than one concept is being considered.

Card AØ1, Block 6. Revision Code, DED 156, 1A. Enter an "A" for the first change, "B" for the second change, etc., if changes to the data sheet are considered significant.

Card AØ1, Block 7. Data Sheet Status Code, DED 025, 1A. Enter "W" if the data sheet is incomplete and in-process, "A" if the sheet has been approved by the ILS/LSAR team (or other designated Government authority), or "C" if the data sheet is complete.

Card AØ1, Block 8. Drawing Classification, DED 027, 3X. Enter the Intended Use Category in the first position, and the Drawing Level in the second position as identified in MIL-D-1000A. Enter a "Y" if the drawing is proprietary or, "N" if it is nonproprietary, in the third position.

Card AØ1, Block 9. Serial Number Effectivity, DED 164, 20X: Enter the serial number of the first and last affected next higher assembly to which the data sheet applies in the "from" and "to" blocks. If only a single item applies, the same serial number will be entered in both blocks. When the ending number is unknown, "SUB" (subsequent) will be entered in the serial number "to" data field.

Card AØ1, Block 10. Date, DED 026, 6N. Enter the date as follows: First two spaces - last two digits of the calendar year, third and fourth spaces - numerical sequence of the month (i.e., Ø1, Ø2,. . . . . 12), fifth and sixth spaces - day of the month. Example: 5 Mar 77 is entered as 77Ø3Ø5.

Card AØ1, Block 11. Update Code, DED 215, 1A. Enter the status of the particular card: "A", "D", or "C" denote a card addition, deletion, or change respectively. Update code appears on each card in column 8Ø (Mandatory for ADP system).

Card AØ2, Block 1. Item Name, DED 063, 19X. Enter the item name as contained in Handbook H6-1, or the name assigned in accordance with MIL-STD-100. Abbreviations for item name will be in accordance with MIL-STD-12.

Card AØ2, Block 2. Type, Model, Series Designator, DED 206, 26X. Enter the codes segmented into four sections corresponding to Type, Model, Series, and Suffix Designator respectively.

Card A02, Block 3. Conversion Factor, DED 021, 4N. Enter the multiplier needed to convert the item being analyzed to end item operating time. For example, if a radar is operated 3 hours during maintenance and preflight and 3 hours during the entire flight, a multiplier of .5 is used to convert the operating hours of the radar to aircraft hours. It is the multiplier used to multiply the operating hours of item under analysis to arrive at the operating hours of the end item.

Card AØ3A, Block 1. Manufacturer's Part Number, DED 086, 32X. Enter the part number of the item for which the data sheet is being prepared. If the part number is over 16 digits, the remaining numbers are put on card AØ3B, block 1. Enter the overflow indicator "A" in the LRNC block on the AØ3A card if the part number is over 16 digits long.

Card AØ3A, Block 2. Federal Supply Code for Manufacturers (FSCM), DED 051, 5X. Enter the code that identifies the source of Manufacturer's Part Number.

Appendix B--Continued

Card AØ3A, Block 3. Drawing Number, DED 028, 32X. Enter the drawing number of the item for which the data sheet is being prepared. If the drawing number exceeds 16 digits, the overflow indicator "A" is inserted in the LRNC block and the remaining digits are put on card AØ3B, block 3.

Card AØ3A, Block 4. Federal Supply Code for Manufacturers (FSCM), DED 051, 5X. Enter the code that identifies the source of Drawing Number.

Card AØ4, Block 1. Annual Operating Requirements, DED 009, 6N. Enter the estimated or required yearly usage of the item. Three blocks are provided to record the requirements when they are expressed in more than one measurement base.

Card AØ4, Block 2. Measurement Base Code, DED 095, 1A. Enter the measurement base code(s) for the number(s) on card AØ4, block 1.

Card AØ4, Block 3. Annual Number of Missions, DED 007, 6N. Enter the specified or estimated number of missions performed annually.

Card AØ4, Block 4. Annual Operating Days, DED 008, 3N. Enter average number of days per year that a mission demand will be placed on the item.

Card AØ4, Block 5. Mean Mission Duration, DED 089, 5N. Enter the average length of the mission.

Card AØ4, Block 6. Measurement Base Code, DED 095, 1A. Enter the code to identify the measurement base for card AØ4, block 5.

Card AØ5, Block 1. Maintenance Requirements for Organizational (AVUM) Level, No DED. A group title for data elements to specify the maintenance requirements by maintenance level. Cards AØ5 and AØ6 will include the sum of the operator/crew maintenance requirements and organizational (AVUM) maintenance requirements.

Block 1A. Number of SystemsSupported, DED 109, 6N. Enter the number of systems supported by each organizational (AVUM) level maintenance organization. If the number is not fixed, use one (1).

Block 1B through 1F. Task Intervals, Inspections, DED 032, 082, 5N. Enter the mean elapsed time and mean man-hours in tenths of hours for each inspection requirement applicable to the system/equipment. Leave blocks which are not applicable blank.

Appendix B--Continued

Card AØ6. Continuation of card AØ5, Maintenance Requirements for Organizational (AVUM) Level, No DED.

Block 1G. Unscheduled Maintenance (Time), DED 214, 5N. Enter the mean elapsed time and mean man-hours in tenths of hours.

Block 1H. Turnaround (Time), DED 203, 5N. Enter the mean elapsed time and mean man-hours in tenths of hours.

Block 1I. Mission Profile Change (Time), DED 098, 5N. Enter the mean elapsed time and mean man-hours in tenths of hours.

Block 1J. Man-Hours (Maintenance) per Operating Hour, DED 081, 5N. Enter the ratio of the maintenance man-hours expended per operating hour by the categories of scheduled (preventive) and unscheduled (corrective) maintenance time in tenths of hours.

Block 1K. Annual Maintenance Man-Hours, DED 006, 5N. Enter the estimated or predicted scheduled (preventive) and unscheduled (corrective) annual maintenance man-hours in tenths of hours.

Card AØ7, Block 1. Maintenance Requirements for Intermediate/Direct Support Maintenance/Afloat (AVIM), No DED. Blocks are to be completed as described on cards AØ5 and AØ6, but the maintenance level is for intermediate/direct support maintenance/afloat (AVIM).

Card AØ8, Block 1. Maintenance Requirements for Intermediate/General Support Maintenance/Ashore, No DED. Blocks are to be completed as described on cards AØ5 and AØ6 but the maintenance level is for intermediate/general support maintenance/ashore.

Card AØ9, Block 1. Maintenance Requirements for Depot Maintenance, No DED. Blocks are to be completed as described on cards AØ5 and AØ6 but the maintenance level is for depot maintenance.

Card A1Ø. System/End Item Availability, No DED.

Card A1Ø, Block 1A. Mean Time To Repair (MTTR), DED 093, 6N. Enter the MTTR for a particular period of time.

Card A1Ø, Block 1B. Mean Time Between Failures (MTBF), DED 090, 6N. Enter the MTBF for a particular interval.

Card A1Ø, Block 1C. Availability (inherent, Ai), DED 013, 4N. Enter the calculated inherent availability in accordance with the procedures defined in DED 012. The result will be expressed as a percentage with the capability of recording to hundredths of a percent.

Appendix B--Continued

Card A1Ø, Block 1D. Mean Active Maintenance Downtime (MAMDT), DED 088, 6N. Enter the mean active maintenance downtime for a particular interval.

Card A1Ø, Block 1E. Mean Time Between Maintenance Actions (MTBMA), DED 091, 6N. Enter the mean time between maintenance action for a particular interval.

Card A1Ø, Block 1F. Availability (achieved, Aa), DED 013, 4N. Enter the calculated achieved availability in accordance with the procedures defined in DED 012. The result will be expressed as a percentage with the capability of recording to hundredths of percent.

c. Data Sheet B, Item Reliability (R) and Maintainability (M) Characteristics. (Data Sheet B is not presently processed by the available standard ADP programs.)

Cards BØ1, BØ2, and BØ3A/B are identical to cards AØ1, AØ2, and AØ3A/B and the same instructions apply.

Card BØ4, Block 1. Maintainability Considerations Code, DED 073, 1A. As each item on the checklist is evaluated, or re-evaluated, indicate whether the design provisions are adequate from the maintenance/maintainability viewpoint. The individual functions will be evaluated by entering the code "A" for adequate or an "N" for not adequate.

Card BØ4, Block 2. Maintenance Concept Impact, DED 077, 1A. Enter a "Y" or "N" to indicate whether the items listed are required for performing maintenance. Details should be provided on card BØ9.

Card BØ4, Block 3a. Mean Time Between Failures (MTBF), DED 090, 6N. Enter the MTBF of the item for which the data sheet is being prepared, based on the failures identified on card BØ5.

Card BØ4, Block 3b. Mean Time to Repair (MTTR), DED 093, 6N. Enter the weighted average of all repair times entered on card BØ5, column e.

Card BØ4, Block 3c. Mean Time Between Maintenance Actions (MTBMA), DED 091, 6N. Enter the MTBMA of the item for which the data sheet is being prepared.

Card BØ5, Block 1. Failure Analysis, DED 045.

Column a. Failure Mode, DED 048, 48X. List the pertinent failure modes associated with this item. When feasible, they should be listed in descending order of occurrence or importance.

Column b. Failure Symptoms, DED 049, 200X. Identify the symptoms that would assist in isolating and diagnosing the failure.

Column c. Failure Effect and Criticality, DED 046, 48X. Describe the effect a failure would have on end item/system operation and give a relative figure of merit to the criticality. Indicate whether the system would be completely inoperable, inoperable in some modes, or operable at a degraded level of performance.

Column d. Percentage of Failure Rate, DED 118, 3N. Enter the percentage that each failure mode contributes to the overall failure rate.

Column e. Repair Time, DED 150, 5N. Enter the active repair time (mean elapsed time) for each failure mode.

Column f. Task Code, DED 182, 7X. Enter the task code of the corrective maintenance task(s) which results from the failure mode. The task code will be utilized to associate each failure mode with the maintenance task(s) listed on Data Sheets C and D.

Card BØ6, Block 1. Reliability Centered Maintenance Analysis.

Column a. Logic Results, 14X. For blocks 1a-2b enter a "Y" in the appropriate block(s) that have a yes answer. The "a" blocks are used to document the results for safety considerations and the "b" blocks are used to document the results for the mission portion of the questions in blocks 1 and 2 of figure C-2. All four blocks will be addressed for each failure mode identified on the BØ5 card. For blocks 3-14 enter a "Y" or "N" to denote a yes or no answer respectively to each corresponding question in the logic tree in figure C-2. For those questions which do not require addressing when applying the logic, leave the corresponding block on the BØ6 card blank.

Column b. Disposition, 4X. Enter a "Y" in the appropriate column if condition monitoring, on-condition, and/or hard time maintenance requirements are required for each failure mode. For card column 33, enter a "Y" if a design review is recommended or an "N" if it is not recommended.

Column c. Task Analysis Documentation, 20X. Enter the FGC/WBS/WUC, task code, and sequential line number from the DØ5 card which documents the recommended on-condition or hard time task. For those failure modes where only condition monitoring is required, leave this data blank.

Card BØ7, Block 1. Item Functions, DED 062, 4000X. Describe the function of the item. Sufficient information should be given to indicate clearly the function, specifications, and tolerance, i.e., "Supply 2 cu ft/minute of air, ± .2 cu ft, at 3000 psi, + 0, -500 psi, for normal activiation

of pilot's canopy, nose and main landing gear extension, wheel brakes, and flap extension."

Card BØ8, Block 1. Qualitative Maintainability Requirements, DED 137, 4000X. A data chain to allow for the various requirements such as fail safe and environmental requirements, etc.

Fail Safe Requirements, DED 044, 2000X. Identify design factors such as fail safe provisions necessary to protect personnel from serious injury or equipment from damage.

Environmental Considerations, DED 034, 2000X. Enter the environmental conditions under which the item must operate satisfactorily. Limiting factors such as the following should be considered: shock limits, vibration limits, ambient temperature ranges, operating temperatures in area (compartment) where the item is installed in the system/end item, humidity factors, altitude factors, dust and dirt factors, resistance to salt or other corrosive atmospheres, electromagnetic interference, and light sensitivity.

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Appendix B--Continued

Card BØ9, Block 1. Maintenance Concept, DED 076, 4000X. Enter a concise and clear statement of the maintenance and support concept for the system/equipment at a defined level of readiness or in a specified condition in support of the operational requirement. This statement will identify maintenance approaches such as methods of detecting and isolating failures, planned location of maintenance capabilities, and special maintenance or logistic procedures. This statement shall reflect consideration of the nature and frequency of principal preventive and corrective maintenance tasks, the assignment of SMR (source, maintenance, and recoverability) codes, and the related special and common support equipment requirements. The effects of the maintenance environment on the item are also considered. Pertinent human factor engineering principles and criteria should be included. Information presented shall be the basis for follow-on decisions and provide guidance for detailed approaches set forth on Data Sheets C and D.

Card B1Ø, Block 1. Remarks, Recommendations, Justification, DED 148, 4000X. Enter amplifying Remarks when any maintainability considerations (card BØ4) are coded "N". Enter maintainability Recommendations if the current maintenance concept needs improving. Enter Justification to the current maintenance concept. The justification will be of historical value to establish the rationale in the decision.

d. Data Sheet C, Task Analysis Summary.

Cards CØ1, CØ2, and CØ3A/B are identical to cards AØ1, AØ2, and AØ3A/B and the same instructions apply.

Card CØ4, Block 1. Task Code (Data Chain), DED 182, 7X.

Task Function Code, (1st digit), DED 182, 1A. Enter the applicable task function code, as described on Data Sheet C to indicate the task function.

Task Interval Code, (2nd digit), DED 185, 1A. Enter the applicable task interval code, as described on Data Sheet C to indicate the task interval.

Maintenance (Level) Code (3rd, 4th, and 5th digit), DED 078, 3A. Enter the code for the maintenance level or category for the Army in the 3rd digit, the Navy level in the 4th digit, and the Air Force in the 5th digit. The code "X" (for not applicable) should not be used if multiple service use of the item is a possibility.

Operability Code (6th digit), DED 111, 1A. Enter the code for the operating condition of the item while the task function is performed.

Task Sequence Code (7th digit), DED 186, 1X. If the first six digits do not uniquely identify a task then the seventh digit will be coded; e.g., two different unscheduled repair tasks at the same maintenance level would be coded as JGOXXAA and JGOXXAB.
Note. If more than one card is required to define a task, the task code is duplicated on all cards for that particular task. See the note at the end of the CØ4 card instructions for rules.

Card CØ4, Block 2. Task Frequency, DED 183, 5N. Enter, to hundredths, the task frequency based on the annual operating requirements indicated on card AØ4, block 1. For example: the frequency of a monthly inspection would be indicated as Ø12.ØØ; another example, assume 6ØØ hours is the annual operating requirements (card AØ4, block 1) and a task function is to be performed every 12ØØ hours (once every two years) then the task frequency would be ØØØ.5Ø. The annual operating requirements contained on card AØ4, block 1 must be used to compute the frequency of all tasks identified with the end item. If more than one card is required to define a task, the task frequency is duplicated on all cards for the particular task.

Card CØ4, Block 3. Measurement Base Code, DED 095, 1A. Enter the measurement base code from card AØ4, block 2.

Card CØ4, Block 4. Elapsed Time, Mean, DED 032, 5N. Record the total mean elapsed time required to perform the task. If more than one card is required to define a task, the total mean elapsed time is duplicated on all cards for the particular task.

Column A, Allocated (Time), DED 032, 5N. Enter the time allocated for the task. This entry will be based on the repair time entry on card BØ6, block 1, column e.

Column B, Predicted (Time), DED 032, 5N. Enter the predicted task time. The predicted time is based on a detailed task analysis (Data Sheet D) performed on the item during its design.

Column C, Measured (Time), DED 032, 5N. Enter the task time measured during physical teardown demonstration or maintenance performed during other testing.

Card CØ4, Block 5. Pilot Rework/Overhaul Candidate (PR/O Cand), DED 125, 1A. Enter the code "Y" for yes or "N" for no to indicate if item is a candidate for an overhaul process analysis. Only items with a "K" code in the task function column of the task code are candidates. A code "A" is entered when the item has been approved by the procuring activity as a candidate for analysis.

Appendix B--Continued

Card CØ4, Block 6. Skill Level Code, DED 169, 1A. Provide a code which denotes the skill level required by each technician. Enter "B" for basic, "I" for intermediate, or "A" for advanced.

Card CØ4, Block 7. Skill Specialty Code (SSC), DED 170, 7X. Enter the skill specialty code for each technician performing the task. When more than one SSC is used on the task, each SSC is entered on a separate card. The same rule applies if different SSC's are assigned because of multiple service use of the item.

Card CØ4, Block 8. Skill Specialty Evaluation Code (SS EVAL), DED 171, 1A. Enter a code to indicate the adequacy of the SSC entered in block 7. Enter an "A" for adequate, "M" for needs modification, or "E" for new skill specialty. The evaluation may use the following criteria:

(1) The SSC is assumed to be adequate if the present training program (revised only to include an orientation on the item under development, without extending the course length) is satisfactory to teach new, inexperienced personnel the skills required to perform the task. In this case, personnel must be capable of performing the specified task with the designated tools, support and test equipment, and equipment publications.

(2) The skill specialty requires modification if the training program for the SSC requires revision to teach new, inexperienced personnel additional skills, and if the present training program must be extended. In this case, personnel who received training prior to introduction of the new equipment will require additional training.

(3) If the training program requires extensive modification and substitution of materiel, or if there is no present training program, the SS evaluation should be coded "E". If a code "M" or "E" is entered in block 8, a "G" sheet must be prepared to evaluate and justify the requirement.

Card CØ4, Block 9. Number of Men per Task, DED 107, 2N. The total number of men required with a particular SSC, whether full or part time, to perform a given task.

Card CØ4, Block 10. Man-hours, Mean, DED 082, 5N. Record the mean man-hours allocated, predicted, and measured for each SSC. The same basis for differentiating between allocated, predicted, and measured times will be observed as defined in the elapsed time instructions, card CØ4, block 4.

Card CØ4, Block 11A. Facility Requirements Code (FAC), DED 041, 1A. Enter the code "Y" for yes and "N" for no to indicate whether special or additional facilities are required. If code "Y" is entered, Data Sheet F must be completed to describe and justify each facility requirement.

Card CØ4, Block 11B. Training Equipment Requirements Code (TRN EQP), DED 201, 1A. Enter a code "Y" for yes or "N" for no to indicate whether training equipment is required. If code "Y" is entered, a Data Sheet E will be prepared to describe and justify each item required.

Card CØ4, Block 11C. Support Equipment Grouping Identification Number, DED 179, 3N. A contractor-assigned number used to functionally categorize support and test equipment for analysis purposes. For example, voltmeters could be assigned a grouping number of "100". Subsequently, all task requirements for voltmeters would be analyzed to select the voltmeter(s) that best satisfied the requirement.

Card CØ4, Block 11D. Tool Requirement Code (TOOL CD), DED 196, 1A. Enter an "S", "C", "B", or "N" to denote if a peculiar tool, common tool, both peculiar and common tools, or no tools are required to do the task, respectively. If either "S" or "B" is entered, a Data Sheet E is prepared to describe and justify each peculiar tool.

Note. Cards CØ4A through C04Z and C04Ø through C049 may be used for each FGC/WBS/WUC if required. Multiple CØ4 cards will be required if more than one SSC (block 7) or Support Equipment Grouping Identification Number (block 11C) is assigned to the task. When more than one card is required to define a single task, the following rules apply:

1. The Task Code (block 1), Task Frequency (block 2), Measurement Base (block 3), and Elapsed Time (block 4), are repeated (duplicated) on each subsequent card.

2. If an additional card(s) is required for identifying an SSC, enter the Skill Level (block 6), SSC (block 7), SS Evaluation (block 8), Number of Men per Task (block 9), and Man-Hours (block 10) on the appropriate card.

3. The Support Equipment Grouping Identification Number (block 11C) is applied against the Task Code and has no significance to a SSC which appears on the CØ4 card with it. The first grouping number will be entered on the first CØ4 card prepared against the Task Code; the second grouping number on the second CØ4 card, etc. If an additional card(s) is required to record a Support Equipment Grouping Identification Number, only the data fields listed in paragraph 1 above are required.

e. Data Sheet D, Maintenance and Operator Task Analysis.

Appendix B--Continued

Cards DØ1, DØ2, and DØ3A/B are identical to cards AØ1, AØ2, and AØ3A/B (except card DØ1, block 2, Task Code is added) and the same instructions apply. (Cards DØ4 and DØ7 are the only D sheet entries presently processed by the available standard ADP programs.)

Card DØ1, Block 2. Task Code, DED 182, 7X. The code from card CØ4, block 1, is entered to identify the task for which the "D" sheet is being completed.

Card DØ4, Block 1. Task Identification, DED 184, 40X. Enter a descriptive title for the task (e.g., replace brake assembly).

Card DØ4, Block 2. Safety Hazard Level Code, DED 157, 1N. Enter a code to indicate an existing or potential hazardous condition while performing the task. Enter a 1, 2, 3, or 4 to denote a hazard state of negligible, marginal, critical, or catastrophic, respectively. See MIL-STD-882 for definitions.

Card DØ5, Block 1. Sequence Line Number (SLN), DED 162, 2N. Assign a line number, starting with Ø1 and continuing to 99 if necessary, to each distinct task step.

Card DØ5, Block 2. Sequential Task Description, DED 163, 500X. Enter a concise description of the step by step procedures to accomplish the task. Each technician working on the task should be assigned a Man Identifier letter code. The codes are listed at the top of the columns on card DØ8. The task description should identify steps for fault diagnosis, interference tasks, removal/replacement or repair, reassembly, and checkout. Also, special procedures, tolerances, calibration, alignments, measurement ranges, safety precautions, and other qualifying notes will be included. This information must be presented in sufficient detail to permit development of equipment manuals without repeating or duplicating the analysis effort. Interference tasks, fault location tasks, etc., that are documented under a separate task description may be referenced by FGC/WBS/WUC and Task Code. However, the task time, skill requirements, usage of tools, support equipment, and parts must be included in order to identify all support requirements for the task under analysis.

Card DØ6, Block 1. Sequence Line Number (SLN), DED 162, 2N. Enter the sequence line number from the DØ5 card which corresponds to the task step for which the DØ6 card is being completed.

Card DØ6, Block 2. Work Area Code, DED 223, 4X. Enter the code for the work area where the task is to be performed. The code is assigned by the contractor. (Example: Ø12Ø = wheelwell aircraft.)

Card DØ6, Block 3. Man Identifier (Man ID), DED 083, 1A. Assign an alpha code "A-H" to each man working on the task to differentiate each work assignment. The man identifier codes appear above each column on the DØ8 cards.

Card DØ6, Block 4. Skill Specialty Code (SSC), DED 170, 7X. Enter the codes identified on block 7 of the CØ4 card.

Card DØ6, Block 5. Man-hours, Mean, DED 082, 5N. Enter the mean man-hours for each step of the task identified by a Sequence Line Number.

Card DØ6, Block 6. Elapsed Time, Mean, DED 032, 5N. Enter the mean elapsed time for each step of the task.

Card DØ7, Block 1. Manufacturer's Part Number, DED 086, 16X. Enter the part number of the item being identified on the DØ7 card. All items which are required to perform the maintenance task will be listed including tools, test equipment, repair parts, bulk items, support items, etc.

Card DØ7, Block 2. Item Category Code (ICC), DED 061, 1X. Enter the code which best describes the item being identified on the DØ7 card.

Card DØ7, Block 3. Item Name, DED 063, 19X. Enter the item name as contained in Handbook H6-1, or the name assigned in accordance with MIL-STD-100. Abbreviations for item name will be in accordance with MIL-STD-12.

Card DØ7, Block 4. Quantity per Task, DED 138, 5N. Enter the number of items used to perform the task. For tasks where the items are not used for every occurrence of the task (e.g., overhaul tasks, or tasks which read "remove and replace as necessary"), enter the expected average number per task. (Example: one of the items is used, on the average, for every second occurrence of the task. Then the quantity per task is Ø.5).

Card DØ8A, Block 1. Skill Specialty Code (SSC), DED 170, 7X. Enter the skill specialty codes from card CØ4, block 7, under the appropriate Man Identifier column.

Card DØ8B, Block 1. Man-hours, Mean, DED 082, 5N. Enter total man-hours expended by each Skill Specialty Code and Man Identifier. The man-hours entered in these columns are also entered on card CØ4, block 10, column B.

Appendix B--Continued

Card DØ8B, Block 2. Total Elapsed Time, DED 198, 5N. Enter the total mean elapsed time for the task. The time entered in this block is also entered on card CØ4, block 4, column B. The total elapsed time is not necessarily the sum of card DØ6, block 6 times. The times may differ because sequential task steps are performed concurrently; i.e., more than one man is working at a time. Total Elapsed Time may be determined by plotting a time-line of the sequential task steps.

f. Data Sheet "E", Support Equipment, Special Tools or Training/ Material Description and Justification. Cards EØ1, EØ2, and EØ3A/B are identical to corresponding A cards and the same instructions apply. (Data Sheet E is not presently processed by the available standard ADP programs.)

Card EØ4, Block 1. Type of Item Code, DED 208, 3A. The code is a three part code to describe the item. The first digit is the Special Materiel Content Code, the second digit is the Provisioning List Category Code, and the third digit is the Special Maintenance Category Code.

Card EØ4, Block 2. Operating Dimensions and Weight, No DED.

Block 2a, Length, DED 066, 4N. Enter the length of the item in its operating condition. When the operating volume of the item is more appropriate than length, width, and height, enter Volume (DED 179) in the Length block, and enter the appropriate Unit of Measure Code in block 2d.

Block 2b, Width, DED 222, 4N. Enter the width of the item in its operating condition.

Block 2c, Height, DED 055, 4N. Enter the height of the item in its operating condition.

Block 2d, Unit of Measure Code, DED 210, 2A. Enter the code for the units (inches, feet, etc.) in which length, width, and height (or volume) are expressed.

Block 2e, Weight, DED 221, 6N. Enter the weight of the item in its operating condition.

Block 2f, Unit of Measure Code, DED 210, 2A. Enter the code for the units (pounds, tons, etc.) in which the weight is expressed.

Card EØ4, Block 3. Storage Dimensions and Weight, No DED. The instructions for block 3 are identical to block 2, except the shipping or storage dimensions are entered.

Appendix B--Continued

Card EØ5, Block 1. Procurement Concept Code, DED 130 1N. Enter the code for the recommended procurement method.

Card EØ5, Block 2. Unit Cost, DED 209, 10X.

Block 2a, Nonrecurring (Cost), DED 106, 10X. Enter the total cost of development, tooling for manufacture, and other nonrecurring costs. Enter the Unit Price Marker (UPM, DED 212) in column 27.

Block 2b, Recurring (Cost), DED 142, 10X. Enter the recurring costs per item. Recurring cost is the manufacturing cost (parts, labor, and material) for a single unit of the item. Enter the Unit Price Marker (UPM, DED 212), in column 38.

Card EØ5, Block 3. Total Quantity Recommended, DED 200 6N. Enter the total number of the item recommended, on order, or required to support all levels of maintenance.

Card EØ5, Block 4. Extended Unit Price, DED 036, 12N. Enter the total cost of the item. The total cost is the product of the recurring cost (block 2b) and the total quantity recommended (block 3) plus the nonrecurring cost (block 2a).

Card EØ5, Block 5. Support Equipment Grouping Identification Number, DED 179 3N. Enter the number that was assigned on card CØ4, block 11C.

Card EØ6A/B, Block 1. Functional Group Code/Work Breakdown Structure/ Work Unit Code (FGC/WBS/WUC), DED 054, 224, 225, 11X. Enter each FGC/WBS/ WUC number that requires the use of item for which the "E" sheet is being prepared. This is to provide a check that all requirements on the "C" sheets have been addressed and identified.

Card EØ6A/B, Block 2. Task Code, DED 182, 7X. Enter the task codes associated with each FGC/WBS/WUC entered in block 1.

Card EØ7, Block 1. Parameters Measured, DED 116, 12X. Enter the parameter(s) that the TMDE item will measure (e.g., volts DC, volts AC, amperes, etc). Use the remarks card, E31, if additional information is required.

Card EØ7, Block 2. Range (from) DED 139, 8N. Enter the lower limit value of the parameter(s) being measured

Card EØ7, Block 3. Units, DED 213, 1A. Enter the appropriate code for the numerical suffix required in conjunction with the range value entered in card EØ7, Block 2.

Appendix B--Continued

Card EØ7, Block 4. Range (to) DED 139, 8N. Enter the upper limit value of the parameter(s) being measured.

Card EØ7, Block 5. Units, DED 213, 1A. Enter the appropriate code for the numerical suffix required in conjunction with the range value entered in EØ7, block 4.

Card EØ7, Block 6. Percent Accuracy, DED 175, 5N. Enter the accuracy (+/-), in percentage of readout, in terms of its relation to the actual value of the parameter being measured or tested. Use the remarks section for additional information if required.

Card EØ7, Block 7. No. of Ranges, DED 108, 3X. Indicate the number of ranges available/planned for the TMDE. Provide a breakout of these ranges in the remarks section if required.

Card EØ8, Block 1. Justification, DED 065, 1000X. List the task requirements that indicated a need for the support equipment, peculiar tool or training material. Justify why a common (military or commercial) item cannot be used, must be modified to a special configuration, or why the peculiar item is more cost effective. For TMDE, explain why the newest TMDE Registered and DA preferred item cannot be used.

Card EØ9, Block 1. Support and Test Equipment or Training Material Description of Operation and Function, DED 181, 1000X. Enter a narrative description of the item and the functions it will be required to perform.

Card E1Ø. Block 1. Support and Test Equipment or Training Material Characteristics, DED 180, 1000X. Enter a narrative description of the item's operational characteristics and capabilities. Describe the calibration and maintenance requirements. Include general operating and design characteristics.

Card E11, Block 1. Additional Skill Requirements, DED 002, 1000X. Enter the new skill or additional training requirements that necessitate the creation of a new Skill Speciality Code.

Card E12, Block 1. Installation Factors, DED 057, 500X. Enter vibration and shock mounting requirements, special foundations, utility connections, input and limiting environmental factors which influence the installation of the item. List any equipment necessary to install the item; e.g., cranes, hoists, etc.

Card E13, Block 1. Operating Voltage Range, DED 218, 6N. Enter the lower and upper AC voltage required to operate the TMDE, e.g., 110-115 VAC, 220-240 VAC.

Card E13, Block 2. Frequency, DED 053, 6N. Enter the lower and upper frequency, in Hertz, required to operate the TMDE.

Appendix B--Continued

Card E13, Block 3. Phase DED 121, 1N. Enter the voltage phase of operation as 1, 2, or 3.

Card E13, Block 4. Watts, DED 220, 4N. Enter the power consumption of the TMDE, in watts.

Card E13, Block 5. Other requirements, DED 155, 1000X. Enter the DC voltage required to operate the TMDE and other support requirements such as oil, water, air, etc.

Card E14, Block 1. Calibration Interval, DED 017, 3X. Enter, in days, how often the TMDE must be calibrated for continuous use. If calibration is not required, enter "CNR". If calibration is required but not at specific cyclic intervals, enter "CAN" for "calibration as necessary". Enter in card E27, Remarks, the conditions under which calibration is required.

Card E14, Block 2. Life Cycle Status, DED 067, 15X. Enter the current life cycle status of the TMDE with one of the following: concept, validation, full scale (FS) development, or production and deployment.

Card E14, Block 3. Manufacturers Model No, DED 084, 10X. Enter the manufacturer's Model No.

Card E14, Block 4. Manufacturers Name, DED 085, 29X. Enter the manufacturer's name that corresponds to the FSCM entered in Card E01, block 4.

Card E14, Block 5. Operating and Support Cost, DED 112, 7N. Enter the contractor's projected annual operating and support cost per end item of TMDE, averaged over its expected useful life.

Card E15, Block 1. Managing Command/Agency, DED 080, 12X. Enter the name of the DARCOM major subordinate command or DA agency that has the integrated commodity management of the TMDE (e.g., TARCOM, MIRCOM, etc.). If the commodity manager is unknown, the Director, DA Central TMDE Activity, ATTN: DRXMD-TT, Lexington, KY 40511, will determine the responsibility for the TMDE item management.

Card E15, Block 2. Other Using Commands/Agencies, DED 114, 20X. Enter other commands, agencies, or service(s) that are users of the TMDE.

Card E15, Block 3. Proponent, DED 133, 12X. Enter the name of the military service(s) that are the proponent(s) of the assigned NSN or the services that will be using this TMDE.

Card E15, Block 4. Operators Manual, DED 113, 20X. Enter the military operators manual or commercial instruction manual applicable to the TMDE.

Card E16, Block 1. National Stock Number (NSN), DED 102, 20X. Enter the official NSN, for the item identified in card E02. Block 1, if assigned.

Appendix B--Continued

Card E16, Block 2. Line Item Number (LIN), DED 069, 6X. Enter the LIN of the TMDE as specified in SB 700-20, Army Adopted/Other Items Selected for Authorization/List of Reportable Items. If no LIN is assigned, and item is a component of a tool set, van, etc, specify in the remarks section the LIN of the set of which the TMDE is a component.

Card E16, Block 3. Skill Specialty Code (SSC), DED 170 7X. Enter the SSC, i.e., MOS, required for all tasks as shown on card E06A and E06B.

Card E16, Block 4. Self Testing Feature, DED 160, 6X. If the item is self testing, enter either "Manual" or "Auto". If not, enter "No".

Card E16, Block 5. Logistic Control Code, DED 070, 1A. Enter the logistic control code (LCC) assigned to the TMDE, as listed in SB 700-20, Army Adopted/Other Items Selected for Authorization/List of Reportable Items.

Card E16, Block 6. Type Classification, DED 204, 1A. Enter the appropriate type classification code assigned to the TMDE. If it is a component of a set, note in Card E22, block 1, Remarks, the type classification of the set.

Card E16, Block 7. Meantime Between Failures (MTBF), DED 090, 6N. Enter the MTBF of the TMDE item for which the data sheet is being prepared.

Card E16, Block 8. Meantime to Repair (MTTR), DED 093, 6N. Enter the weighted average of all repair times of the predicted or measured failures

Card E16, Block 9. Reportable Item Control Code (RICC), DED 153, 1N. Enter the RICC assigned to the item.

Card E17, Block 1. Method of Acquiring Test Signal, DED 096, 1000X. Enter a narrative description of how the test signal is obtained from the unit under test.

Card E18, Block 1. Standards for Comparison, DED 177, 1000X. Enter a narrative description of the standards, e.g., performance standards, technical manuals, data on tape, etc, against which the TMDE calibration is compared.

Card E19, Block 1. Voltage Range, DED 218, 6N. Enter the voltage output range of the power source available from the supported system/item itself, or normally available at the maintenance site where TMDE will be used (definition applies to entire card no. E19).

Card E19, Block 2. Frequency, DED 053, 6N. Enter the upper and lower frequency of the power source available to operate the TMDE.

Card E19, Block 3. Phase, DED 121, 1N. Enter the phase of the output voltage available to operate the TMDE.

Appendix B--Continued

Card E19, Block 4. Watts, DED 220, 3N. Enter the maximum output, in watts, of the available power to operate the TMDE.

Card E19, Block 5. Percent Maximum Ripple, DED 119, 5N. Enter the percent maximum ripple of the output voltage of the power source available to operate the TMDE.

Card E19, Block 6. Other Facilities, DED 155, 1000X. Enter the DC voltage and other facilities available that would satisfy the requirements for operation of the TMDE.

Card E20, Block 1. Parameter to be Measured, DED 116, 12X. Enter the parameter(s) within the supported system or item being tested that must be measured by the TMDE (i.e., volts DC, volts AC, ohms, amperes, etc.).

Card E20, Block 2. Range (from), DED 139, 8N. Enter the lower value of the range of the parameter to be measured by the TMDE. Do not enter the TMDE ranges.

Card E20, Block 3. Units, DED 213, 1A. Enter the appropriate code for the numerical suffix required in conjunction with the range value entered in Card E2Ø, Block 2.

Card E20, Block 4. Range (to), DED 139, 8N. Enter the upper limit value of the range of the parameters being measured.

Card E20, Block 5. Units, DED 213, 1A. Enter the appropriate code for the numerical suffix required in conjunction with the range value entered in card E2Ø, Block 4.

Card E20, Block 6. Percent Accuracy, DED 176, 5N. Enter the percent accuracy required by the supported item or item under test for corresponding parameters and ranges. Do not enter the TMDE ranges.

Card E21, Block 1. Year of Fielding, DED 226, 2N. Enter the year that the end item or system will initially be fielded.

Card E21, Block 2. Life Span, DED 068, 2N. Enter the estimated useful life span (in years) of the supported item.

Card E21, Block 2. Modification or Change, DED 100, 1X. If the TMDE is required as a result of modification or change to the end item, enter a "Y" for "Yes". If not, enter a "N", for "No."

Card E21, Block 4. Authority for Modification or Change, DED 012, 10X. If a "Y" was entered in block 3, enter the authority for the modification or change, e.g., DA Modification Work Order, Depot Maintenance Work Requirement, etc.

Appendix B--Continued

Card E21, Block 5. Training Source, DED 202, 250X. Identify the source of planned or established training.

Card E22, Block 1. Test Points, DED 195, 1X. If test points have been made available or designated in the end item, enter a "Y". If not, enter a "N".

Card E22, Block 2. Test Point Description, DED 194, 250X. If a "Y" was entered in E22, Block 1, explain how the signal is to be obtained (Probe on TMDE, functional or test connectors on end item, etc.). If a "N" was entered in E22, block 1, explain how the end item is to be tested.

Card E23, Block 1. Sensors or Transducers, DED 161, 1X. If permanently installed sensors/transducers are provided on the supported end item, enter a "Y". If not, enter a "N".

Card E23, Block 2. Interface Adapters/Signal Conditioning Requirements, DED 058, 250X. If Interface Adapters or Signal Conditioning Circuitry are required, enter a "Y" in card column 17, and describe in columns 18-79 the type of adapters or signal conditioning circuits that are required. If not required, enter "N" in column 17.

Card E24, Block 1. TMDE Registration, DED 193, 1X. If the TMDE item is registered in the DA TMDE register, enter a "Y". If not, enter "N".

Card E24, Block 2. TMDE Register Index Number, DED 192, 7X. If the TMDE is registered, enter the seven digit index number listed in the TMDE Register (DA Pamphlet 700-20).

Card E24, Block 3. Coordinated Test Program (CTP) Adequacy, DED 022, 1X. If the CTP is adequate to verify the suitability of the requested TMDE item for military application, enter a "Y", otherwise, enter "N".

Card E24, Block 4. Technical Data Package (TDP), DED 187, 250X. If an adequate TDP is available for procurement of the requested item, enter a "Y" in the first space. If not, enter a "N" in the first space. If "N", enter a narrative explanation of the deficiencies.

Card E25, Blocks 1 and 2. Economic Analysis, DED 030, 250X. If an economic analysis has been prepared as justification for this TMDE item, enter a "Y" and attach a copy to the E Sheet when forwarding to the DA CTA. If not, enter a "N" and explain why not in Card E25, block 2.

Card E26, Block 1. Initial Quantity of TMDE, DED 138, 7N. Enter the quantity of units of TMDE required initially.

Card E26, Block 2. Date, DED 026, 6N. Enter the date the TMDE is initially required.

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Card E26, Block 3. Estimated Total Quantity, DED 138, 7N. Enter the estimated total quantity of TMDE to be purchased.

Card E26, Block 4. Date, DED 026, 6N. Enter the date the total quantity of TMDE is required.

Card E26, Block 5. Nearest Preferred Item Index, DED 103, 7X. Enter the Index Number of the nearest item in the DA TMDE Register having a substitute capability.

Card E26, Block 6. Nearest TMDE Register Item Index, DED 104, 7X. Enter the Index Number of the nearest item in the DA TMDE Register having substitute capability.

Card E27, Block 1. Remarks, DED 147, 1000X. Enter information considered useful in describing TMDE in addition to that referenced in preceding E Sheet instructions. Enter the R & D task number if the TMDE is in R & D.

g. Data Sheet "F", Special Facility Description and Justification. (Data Sheet F is not presently processed by the available standard ADP programs.)

Card FØ1, Block 1. Functional Group Code/Work Breakdown Structure/ Work Unit Code, (FGC/WBS/WUC), DED 054, 224, 225, 11X. Enter the FGC/ WBS/WUC assigned for the facility (if one is assigned).

Card FØ1, Block 2. End Item Acronym Code, DED 33, 6X. Enter the end item acronym code for the system/end item indicated on Card AØ1, block 2.

Card FØ1, Block 3. Service Designator Code, DED 166, 1A. Enter the code for the military service requiring the facility.

Card FØ1, Block 4. Federal Supply Code for Manufacturers (FSCM), DED 051, 5X. Enter the code of the manufacturer of the end item.

Card FØ1, Blocks 5, 6, 7, and 8 are identical to card AØ1, blocks 5, 6, 7, and 8 and the same instructions apply.

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Appendix B--Continued

Card FØ1, Block 9. Item Name, DED 063, 19X. Enter the name of the facility.

Card FØ1, Block 1Ø. Date, DED 026, 6N. Enter the date in accordance with AØ1, block 1Ø instructions.

Card FØ1, Block 11. Facility Category Code, DED 040, 6N. Enter the code as prescribed in AR 415-28.

Card FØ2A/B, Block 1. Functional Group Code/Work Breakdown Structure/ Work Unit Code (FGC/WBS/WUC), DED 054, 224, 225, 11X. Enter the FGC/WBS/ WUC codes of the items that require the facility.

Card FØ2A/B, Block 2. Task Code, DED 182, 7X. Enter the task code associated with each FGC/WBS/WUC entered in block 1.

Card FØ3, Block 1. Facilities Requirements, DED 039, 4000X. Enter a narrative description of the tasks and functions to be performed in the facility (a summary of the requirements from blocks 1 and 2 of cards FØ2A/B).

Card FØ4, Block 1. Facilities Design Criteria, DED 037, 4000X. Enter the requirements for items to be installed within the facility; e.g., turning space, clean room, ventilation, etc.

Card FØ5, Block 1. Facilities Installation Leadtimes, DED 038, 500X. Specify installation leadtime for the contractor to produce and install support equipment, or for training equipment installation and use. Reference leadtimes to system/equipment delivery dates rather than to calendar dates.

Card FØ6, Block 1. Type of Construction, DED 207, 2000X. Enter construction type required if different from those normally provided. Include any special construction, such as shock, hardness, and special floor loads.

Card FØ7, Block 1. Utilities Requirements, DED 217, 2000X. Enter a summary or estimate of the total connected load or gross quantity of utilities required. Utilities are to be classed as electric power, hydraulic, compressed air, water, or sewerage.

Card FØ8, Block 1. Facility Utilization, DED 043, 500X. Specify the facility utilization rate in terms of number of tasks performed in the facility annually, training sessions, flying hours per month, number of maintenance hours per month, and other appropriate designators identified to the system.

Appendix B--Continued

Card FØ9, Block 1. Facility Unit Cost Rationale, DED 042, 500X. Comment on the reasonableness of the appropriate unit cost in terms of differences because of unusual utility requirements, or other special features. If no suitable unit cost is available, provide a unit cost estimate for each facility item.

Card F1Ø, Block 1. Justification, DED 065, 4000X. Enter the reasons and factors which make it necessary to acquire additional facilities rather than use what is currently available.

Standard Facility Plan(s) or Single Line Sketches. No DED. Draw a rough sketch of the facility or provide a standard plan for the facility. It may be entered into data file in accordance with paragraph B-3a.

h. Data Sheet "G", Skill Evaluation and Justification. (Data Sheet G is not presently processed by the available standard ADP programs.)

Card GØ1, is identical to card AØ1 and the same instructions apply.

Card GØ2, Block 1. Duty Position Requiring A New or Revised Skill, DED 029, 19X. Enter the position title of the new or modified skill requirement (e.g., sonar operator or demolition expert).

Card GØ2, Block 2. Skill Specialty Code (Assigned New Duty Position), DED 170, 7X. If a new SSC has been assigned to the duty position, it will be entered to indicate that the requirement has been fulfilled.

Card GØ3, Block 1. Skill Specialty Code, DED 170, 7X. Enter the skill specialty codes that could be readily cross-trained to the new tasks or equipment.

Card GØ3, Block 2. Aptitude/Qualification Test Score, DED 010, 2N. Enter the minimum score necessary to qualify a candidate for required training.

Card GØ3, Block 3. Security Clearance Code, DED 159, 1N. Enter the minimum security clearance required by the candidate in order to undertake training.

Card GØ3, Block 4. Military Rank/Rate/Grade, DED 097, 3X; Civilian Grade, DED 011, 4X. Enter the grade of the civilian (Civil Service) recommended for specified training. Enter the minimum military rank/rate/grade required to attend the training.

Card GØ4A/B, Block 1. Functional Group Code/Work Breakdown Structure/Work Unit Code (FGC/WBS/WUC), DED 054, 224, 225, 11X. Enter the FGC/WBS/WUC codes of the items whose tasks require new or modified skills.

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Card GØ4A/B, Block 2. Task Code, DED 182, 7X. Enter the task codes associated with the FGC/WBS/WUC in block 1 that generated the skill requirements. These task codes will be coded "M" or "E" on card CØ4, block 8.

Card GØ5, Block 1. Additional Skill Requirements, DED 002, 1000X. Describe the new skill or additional training requirements that necessitate the creation of a new Skill Specialty Code.

Card GØ6, Block 1. Physical and Mental Requirements, DED 123, 1000X. Enter any special knowledge, skills, abilities, or physical and mental attributes necessary to qualify for the new or revised skill specialty.

Card GØ7, Block 1. Educational Qualification, DED 031, 1000X. Enter any additional qualifications such as academic subjects, specialized degrees or licenses for the new or revised skill specialty.

Card GØ8, Block 1. Justification, DED 065, 4000X. Enter the reasons why a present SSC is inadequate or requires modification, and factors which make it necessary to require additional skill and training for the system/equipment operation or maintenance.

Card GØ9, Block 1. Additional Training Requirements, DED 003, 4000X. Enter a narrative description of the training course(s) necessary and specify estimated length of course, hours of instruction, recommended sites, and prerequisites for training and instructions.

i. Data Sheet "H", Supply Support Requirements.

Card HØ1A, Block 1. Manufacturer's Part Number, DED 086, 32X. Enter the manufacturer's part number. If the number exceeds 16 characters, enter the overflow on card HØ1B, block 15. If the overflow portion of the part number contains significant characters that uniquely identify the item (e.g., symbols that describe diameters, lengths, material, or finish), then the following guidelines should be followed:

(1) Place the last 16 characters of the part number in block 1.

(2) Place the remaining prefix characters in block 15 left justified.

(3) Place an "X" in block 16, the Significant Character Code, to indicate that the part number has been reversed.

Appendix B--Continued

Card HØ1A, Block 2. Reference Number Category Code (RNCC), DED 145, 1X. Enter the code which indicates the category or relationship of the part number in block 1 to a National Stock Number or other reference number.

Card HØ1A, Block 3. Reference Number Format Code (RNFC), DED 146, 1N. Enter "1" if the part number is formatted as originally configured/ expressed on originating document ("in-the-clear"). Enter "2" if it is formatted in accordance with Federal Manual for Supply Cataloging M1-6. Enter "3" if format is unknown as to whether the number is restructured or "in-the-clear".

Card HØ1A, Block 4. Federal Supply Code for Manufacturers (FSCM), DED 051, 5X. Enter the manufacturer's code as contained in Federal Cataloging Handbook H4 series for the number appearing in block 1.

Card H01A, Block 5. Item name, DED 063, 19X. Enter the name (in accordance with Cataloging Handbook H6-1) of the item whose part number appears in block 1. Abbreviations contained in MIL-STD-12 shall be used where applicable.

Card HØ1A, Block 6. Item Category Code (ICC), DED 061, 1X. Enter the code that best describes the item for which the "H" data sheet is being prepared.

Card HØ1A, Block 7. Quantity per End Item (Qty/EI), DED 138, 5N. Enter the total quantity of items installed in the end item.

Card HØ1A, Block 8. Type of Item Code, DED 208, 3A. Enter the code for each of the three sub-fields (Special Material Content Code, Provisioning List Category Code, and Special Maintenance Category Code) which best describes the item for which the data sheet is being completed.

Card HØ1A, Block 9. Essentiality Code (EC), DED 035, 1N. Enter a code to describe the effect of the item's failure on end item operation.

Card HØ1A, Block 10. Shelf Life Code (SL), DED 167, 1X. Enter the code that indicates when the item will be considered unusable from age or deterioration. Codes shall be assigned as applicable from the current edition of M1-7, Cataloging Handbook.

Card HØ1A, Block 11. Production Lead Time (PLT), DED 132, 2N. Enter the time in months between placement of a new contract and shipment of the first deliverable quantity.

Appendix B--Continued

Card HØ1A, Block 12. Unit of Measure Code (UM), DED 210, 2A. Enter the unit of measure code as defined in M1-7 for the quantity indicated in the Quantity Per End Item, Quantity Per Assembly, and Unit of Measure Price blocks.

Card HØ1A, Block 13. Total Quantity Recommended (Total Qty Rec), DED 200, 6N. Enter the recommended quantity of the item required to support a specific number of applications for a specific period of time as specified by the Procuring Activity. The applications may be to a weapon system, end item, component or combinations thereof which are contained in the applicable contract. Unless otherwise specified by the Procuring Activity, the support period shall be for one year beginning with the scheduled delivery of the first end item(s).

Card HØ1B, Block 17. Length, DED 066, 4N. Enter the length of the item either with or without packing material as specified by the Procuring Activity. When the volume of the item is more appropriate than length, width, or height, enter Volume (DED 179) in the length block, and enter the appropriate Unit of Measure Code in block 20.

Card HØ1B, Block 18. Width, DED 222, 4N. Enter the width of the item either with or without packing material as specified by the Procuring Activity.

Card HØ1B, Block 19. Height, DED 055, 4N. Enter the height of the item either with or without packing material as specified by the Procuring Activity.

Card HØ1B, Block 20. Unit of Measure Code (UM), DED 210, 2A. Enter the code for the units (inches, feet, etc.) in which Length, Width, and Height (or Volume) are expressed.

Card HØ1B, Block 21. Weight, DED 221, 6N. Enter the weight of the item with or without packing material as specified by the Procuring Activity.

Card HØ1B, Block 22. Unit of Measure Code (UM), DED 210, 2A. Enter the code for the units (pounds, tons, etc.) in which the weight is expressed.

Card HØ1B, Block 23. Packing Code (PCK), DED 115, 1A. Enter "U" if the dimensions and weight represent the item without packing material. Enter "P" if the dimensions and weight include packing material.

Appendix B--Continued

Card HØ2, Block 25. Additional Reference Numbers, DED 001, 32X. Enter the Drawing Number on card HØ2A, the Specification Control Number on card HØ2B, and Two-way Interchangeable Part Numbers on subsequent HØ2 cards. This order must be maintained in order to insure proper processing (i.e., if there is not a Specification Control Number then card HØ2B would not be completed).

Card HØ2, Block 26. Reference Number Category Code (RNCC), DED 145, 1X. Enter the code which indicates the category or relationship of the reference number to a National Stock Number or other reference number.

Card HØ2, Block 27. Reference Number Format Code (RNFC), DED 146, 1N. Enter the code which identifies the format mode of the reference number in block 25.

Card HØ2, Block 28. Federal Supply Code for Manufacturers (FSCM), DED 051, 5X. Enter the code that identifies the manufacturer of the reference number in block 25.

Card HØ2, Block 29. Maximum Allowable Operating Time (MAOT), DED 087, 4X. Enter an expressed period of time after which the item will be maintained in accordance with the Maintenance Action Code, block 30. In the first two positions enter the Applicable Program Units, i.e., 01 through 99. In the third position enter the appropriate multiplier code and in the fourth position enter the Measurement Base Code.

Card HØ2, Block 30. Maintenance Action Code (MAC), DED 074, 1A. Enter the code which indicates the required action to be taken at the expiration of the maximum allowable operating time.

Card HØ2, Block 31. Unit Price, DED 211, 10N. Enter the best estimated price per unit of the item identified in block 1. The estimated price per unit should be based on an end item production quantity as specified by the Procuring Activity. The last two positions are cents with the decimal understood.

Card HØ2, Block 32. Quantity Unit Pack (QUP), DED 138, 3N. Enter the number of units of measure or units of issue to be packaged in a unit pack.

Card HØ3, Block 34. National Stock Number (NSN), DED 102, 20X. Enter the 13 digit NSN starting in position 4 of this block. The Procuring Activity shall specify a single location within the block when management prefix or suffix codes are applicable.

Card HØ3, Block 35. Physical Security/Pilferage Code (PSPC), DED 124, 1A. Enter the security classification code contained in Cataloging Manual M1-7 for the item identified in block 1.

Card HØ3, Block 36. Special Handling Code (SHC), DED 173, 1X. Enter a code if special handling is required because of pilferage or delicacy. The code(s) will be provided by the Procuring Activity.

Card HØ3, Block 37. Phased Provisioning Code (PPC), DED 122, 1A. When MIL-STD-1517 applies, enter the letter P if the item is recommended for Phased Provisioning.

Card HØ3, Block 38. Procurement Control Identifier (PCI), DED 131, 1X. Enter a code indicating the Procurement/Technical Control Retention Status for the item. Applicable codes shall be specified by the Procuring Activity, otherwise leave blank.

Card HØ3, Block 39. Contractor Turnaround Time (CON TAT), DED 020, 3N. Enter the time in days that will elapse from time of receipt of the failed item at the contractor's facility until the item is returned to the designated receiving point.

Card HØ3, Block 40. Repair Cycle Turnaround Time (TAT REP CYCLE), DED 149, 12N. If the item in block 1 is recoverable, enter the elapsed time in days from the receipt of the failed item at the ORG, DSU, GSU, or Depot until the item is ready for reissue.

Card HØ3, Block 41. Replacement Task Distribution (REPL TASK DIST), DED 152, 15N. Enter the percentage of time each maintenance category will remove and install the item identified in block 1. The values must sum to 100 percent.

Card HØ3, Block 42. Army Class Managing Activity (ACMA), DED 011, 3X. Enter the Routing Identifier Code (RIC) of the Army Service Manager responsible for managing the item identified in block 1. This block will only be used to identify those items which will be managed by an Army Service Manager different from the end item Army Service Manager. For example, this block would be completed for Avionics Equipment Managed by the Electronics Command while the end item Helicopter is managed by the Aviation Command.

Card HØ4, Block 44-46. Basis of Issue, DED 016, 15X. This block is divided into four subfields. In the first field the number of special tools/test equipment authorized for a specific range of end items is entered. The second field is used to identify the specific range of end items. For example, if one special tool is authorized to support one to

eight end items, a value of "ØØØ1" is placed in the first field and "1-8" is placed in the second field. If the quantity authorized applies to a specific Army field unit (i.e., Service Company, Battalion Headquarters, Brigade Headquarters, etc.) then the third field is used to identify the type of units (codes are provided in Data Element Dictionary) which are authorized the special tool/test equipment. Enter the BOI Control Code in the fourth field. A maximum of nine different authorization quantities are allowed. Note that card HØ4A should be completed before card HØ4B and card HØ4B before HØ4C.

Card HØ4, Block 47. Basic Issue Item Category (BIC), DED 014, 1A. If the item is a Basic Issue Item (BII), integral component of the end item (ICOEL), additional authorized item, or an expendable supply and/or materiel of a newly procured end item, enter the appropriate code.

Card HØ4, Block 48. Basic issue item list quantity (BILI Qty), DED 015, 3N. If block 47 is coded A, C, D or E enter the quantity of the item identified in Block 1.

Card HØ5, Block 50. LSA Control Number, DED 071 (See FGC/WBS/WUC, DED 054, 223, 224), 11X. Enter the control number which uniquely identifies the location of the item in block 1 in the end item breakdown. If the item is used in more than one next higher assembly, a separate set of HØ5 through H2Ø cards will be completed to record each LSA control number and the corresponding application dependent information.

Card HØ5, Block 51. Source, Maintenance, and Recoverability (SMR) codes, DED 172, 6A. Enter the recommended SMR Codes for the item. Leave the second digit of the recoverability code blank unless otherwise specified by the Procuring Activity.

Card HØ5, Block 52. Failure Factor I, DED 047, 6N. Enter the peacetime maintenance factor for the item identified in block 1 to indicate the number of expected failures, which will require removal and replacement of the item, per 100 end items per year. This is based on a known/estimated end item usage rate.

Card HØ5, Block 53. Failure Factor II, DED 047, 6N. Enter the wartime maintenance factor for the item identified in block 1 to indicate the expected number of failures which will require removal and replacement of the item per 100 end items per year. This is based on a known/estimated wartime usage rate.

Card HØ5, Block 54. Failure Factor III, DED 047, 6X. The first five positions identify areas of deployment as follows: CONUS, Europe, Pacific, Southern Command, Alaska. This block is used to modify the failure factors for environmental condition by area of end item deployment. Enter the code

which represents the best multiplier of the failure factors based on environmental factors. Enter in the sixth position a "W" if the item is subject to wearout failures, otherwise leave the position blank.

Card HØ5, Block 55. Indenture Code (Ind Cd), DED 056, 1A. Enter the code which best describes the breakdown relationship of the item identified in block 1 to the end item. Note. As an option, the LSA-36 output report will automatically generate indenture codes based on the LSA control number structure.

Card HØ5, Block 56. Quantity per Assembly (Qty/Assy), DED 138, 4N. Enter the total number of times the item is used in the assembly of which it is a part.

Card HØ5, Block 57. Remarks, DED 147, 12X. Enter explanatory type data which is considered essential to the provisioning process. This block shall not be used to procure additional data elements.

Card HØ6, Block 59. Provisioning List Item Sequence Number (PLISN), DED 136, 6X. Enter the sequential line item control number for the item identified in block 1. As an option, the LSA-36 Programs will automatically assign the PLISN based on the LSA control numbers.

Card HØ6, Block 60. Next Higher Assembly PLISN (NHA PLISN), DED 105, 6X. Enter the PLISN of the next Higher Assembly or installation in which the item is used. As an option, the LSA-36 programs will automatically assign NHA PLISN based on the LSA control number structure.

Card HØ6, Block 61. Same as PLISN, DED 158, 6X. For subsequent appearance (applications) of the part numbered item on the same provisioning list, enter the PLISN assigned to the first appearance of the item on the list. As an option, the LSA-36 programs will automatically complete this block based on the LSA control number.

Card HØ6, Block 62. Prior Item PLISN, DED 129, 6X. Enter the PLISN which was assigned to the item on the Interim Repair Parts List, Long Lead Items List, or the previous Provisioning List prior to resequencing.

Card HØ6, Block 63. Maintenance Task Distribution (Maint Task Dist), DED 079, 10N. Enter the percentage of repair that can be made at each level of support on a repairable item. The percentage at each level is based on a total of 100 items entering the repair loop. The replacement (condemnation) rate (R/R) is the percentage of items that cannot be repaired in the loop.

Appendix B--Continued

Card HØ7, Block 65. Overhaul/Kit/Set PLISN (OHL/KIT/SET PLISN), DED 110, 6X. Enter the PLISN of the component/assembly for which the item in block 1 would be required to accomplish overhaul. Enter the Kit/Set PLISN if the item in block 1 is part of a kit or set. Note . Both types of entries can be made using multiple HØ7 cards.

Card HØ7, Block 66. Overhaul Quantity (OHL Qty), DED 138, 3N. If the PLISN entered in block 65 represents an overhaul component then enter the quantity of items identified in block 1 required to overhaul 100 of the equipments or components. If the PLISN entered in block 65 represents a Kit/Set then this block is left blank.

Card HØ7, Block 67. Reference Designation, DED 143, 32X. For electronic components, enter the reference designation number in accordance with ANSI Y32.16.

Card HØ7, Block 68. Long Reference Number Code (LRNC), DED 072, 1A. Enter the code "A" in block 68 if any entry is made in block 67. If the Reference Designation in block 67 is greater than 32 characters, enter the overflow characters on card HØ7B. Enter a "B" in the overflow portion of block 68, card HØ7B.

Card HØ7, Block 69. Reference Designation Code (RDC), DED 144, 1A. Enter the code which best defines the type data entered in block 67.

Card HØ8, Block 71. Usable on Code, DED 216, 600X. Enter the codes (Provisioning Control Code (PCC) and a comma) which identifies assemblies, systems, or end items on which the item can be installed.

Card HØ9, Block 73. TM Designation, DED 189, 20X. Enter the number of the repair part special tool list manual or the number of the narrative manual if the parts list is an appendix to it, which contains the item identified in block 1.

Card HØ9, Block 74. TM Change Number (TM Chg), DED 188, 2N. If changes have been made to the TM, enter the most current change number applicable.

Card HØ9, Block 75. TM Indenture Code (TM Ind Cd), DED 191, 1X. Enter a code from 1 to 5 which indicates the number of spaces to indent the item description in the RPSTL. The codes relate to the disassembly breakdown sequence of repair parts in the end item.

Card HØ9, Block 76. Figure Number, DED 052, 4X. If the item in block 1 is illustrated, enter the figure number in this block.

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Card HØ9, Block 77. Item Number, DED 064, 4X. For the figure identified in block 76, enter the item number for the item in block 1.

Card HØ9, Block 78. TM Functional Group Code (TM FGC), DED 190, 11X. Enter a code which identifies the proper system relationship of the item in block 1 to the end item. The TM FGC will be used for RPSTL generation in lieu of the LSA Control Number, if desired.

Card H1Ø, Block 80. Change Authority Number, DED 018, 15X. Enter the Engineering Change Authority Number when a design change affects the item in block 1.

Card H1Ø, Block 81. Interchangeability Code (IC), DED 059, 2A. Enter an alphabetic code to indicate interchangeability when an item previously listed is being replaced by a new item because of a design change or other change.

Card H1Ø, Block 82. Serial Number Effectivity, DED 164, 20X. Enter the starting serial number (from) and the ending serial number (to) for the end items affected by the design change. If only a single item applies, the same serial number will be entered in both blocks. When the ending number is unknown "SUB" (subsequent) will be entered in the serial number "to" data field.

Card H1Ø, Block 83. Provisioning Control Code (PCC), DED 135, 3X. When a design change affects a specific end item/model, enter the PCC assigned to the end item model.

Card H1Ø, Block 84. Total Item Changes (TIC), DED 199, 2N. Enter the total number of times the item is affected by the design change.

Card H1Ø, Block 85. Replaced or Superseding PLISN (Rep or Sup PLISN), DED 151, 6X. Enter the PLISN of the replaced or superseding item.

Card H2Ø, Block 87. Change Authority Number, DED 018, 15X. Enter the change authority number that was entered in card H1ØA, block 80.

Card H2Ø, Block 88. Quantity Shipped, DED 138, 6N. Enter the quantity of design change items shipped.

Card H2Ø, Block 89. Quantity Procured, DED 138, 6N. Enter the total quantity of the provisioned item order.

B-6. Data Element Dictionary. a. Purpose. This section identifies and describes Logistic Support Analysis (LSA) Data Elements which shall be used in the operation of the LSAR.

b. Application. This dictionary applies to any system/equipment acquisition program which incorporates LSA implemented in accordance with this pamphlet. Individual data elements, with related data items and data codes, shall be selected from this dictionary whenever qualitative and quantitative data, to be employed in a particular analysis, match the given data element definitions. Additional data elements, peculiar to a specific acquisition, may be authorized by the procuring activity. Sources are cited for standardized data elements and data codes.

c. Definitions. The following definitions are provided for purposes of interpreting the format used in the dictionary.

(1) Data Element. A grouping of informational units which has a unique meaning and subcategories (data items) of distinct units or values. Examples of data elements are "sex, race, countries of the world, Department of Defense component, contract number, national item identification number, and quantity".

(2) Standard Data Element Title. The actual noun phrase name assigned to the data element. Sufficient adjectival modifiers are used with the noun name to insure title uniqueness.

(3) Data Element Definition. A narrative definition of the data element in sufficient detail to present a clear and complete understanding of the precise data or element of information that the data element represents.

(4) Data Item. A subunit of descriptive information or values classified under a data element. "Countries of the World" contains data items such as "Afghanistan, Albania, Algeria;" the data element "Department of Defense Component" contains data items such as "Department of the Army, Office of Civil Defense."

(5) Data Chain. A name or title given to the use of a combination of two or more logically related standard data elements, data use identifiers, or other data chains. For example, the data chain "Complete Calendar Date" is made from the combination of four data elements "Century, Year, Month, and Day."

(6) Data Code. A number, letter, character, symbol, or any combination thereof used to represent a data item in facilitating machine processing. For example, the data codes "A", "D", and "C" represent the data items "Addition", "Deletion", and "Change" under the data element "Update Code."

(7) Field Format. A specification for the length, type, and justification, and decimal placement of a data element or subunit (data item) thereof:

(a) Length. The number of character positions in the data element. In the event the length is variable, the maximum length is specified.

(b) Type. A specification of the character type, wherein:

1. "A" specifies that all characters of the data entry are alpha.

2. "N" specifies that all characters of the data entry are numeric.

3. "X" specifies that characters of the data entry are alpha, numeric, special, or any combination thereof.

(c) Justification. Specifies from which side of the field the characters of the data element are entered. Those starting at the left are left justified (L), those at the right are right justified (R). Those which always occupy the entire field are fixed (F), as shown below. Left justifed data entries shall leave unused character spaces blank. Right justified entries shall be prefixed with zero(s) to fill any blank character spaces

(L)	3	1	Ø	2			
(R)	Ø	Ø	Ø	3	1	Ø	2
(F)	1	3	1	Ø	2	Ø	5

(d) Decimal Placement. Specifies the number of character positions to the right of the assumed decimal point when the data element is numeric in all character positons. A dash (-) will be used if this column is not applicable. AS means "As Specified" and the detailed instructions in paragraph B-5 will indicate location of decimal points.

d. List of Data Element Titles.

DED NO.	STANDARD DATA ELEMENT TITLES
001	Additional Reference Numbers.
002	Additional Skill Requirements.
003	Additional Training Requirements.
004	Allocated (Time) (See Elapsed Time or Man-Hours).
005	Alternative Action Code.
006	Annual Maintenance Man-Hours.
007	Annual Number of Missions.

Appendix B--Continued

008 Annual Operating Days.
009 Annual Operating Requirements.
010 Aptitude/Qualification Test Score.
011 Army Class Managing Activity (ACMA).
012 Authority for Modification or Change.
013 Availability (A).
014 Basic Issue Item Category Code (BIC).
015 Basic Issue Item List Quantity (BIIL Qty).
016 Basis of Issue.
017 Calibration Interval.
018 Change Authority Number.
019 Civilian Grade.
020 Contractor Turnaround Time (CON TAT).
021 Conversion Factor.
022 Coordinated Test Program Adequacy.
023 Cost.
024 Daily Inspection (Time) (See Elapsed Time or Man-Hours).
025 Data Sheet Status Code.
026 Date.
027 Drawing Classification (Dwg Class).
028 Drawing Number.
029 Duty Position Requiring a New or Revised Skill.
030 Economic Analysis.
031 Educational Qualifications.
032 Elapsed Time, Mean.
033 End Item Acronym Code.
034 Environmental Considerations (See Qualitative Maintainability Requirements).
035 Essentiality Code (EC).
036 Extended Unit Price.
037 Facilities Design Criteria.
038 Facilities Installation Leadtimes.
039 Facilities Requirements.
040 Facility Category Code.
041 Facility Requirements Code (FAC) (See Requirements (For)).
042 Facility Unit Cost Rationale.
043 Facility Utilization.
044 Fail Safe Requirements (See Qualitative Maintainability Requirements).
045 Failure Analysis.
046 Failure Effect and Criticality (See Failure Analysis).
047 Failure Factor.
048 Failure Mode (See Failure Analysis).
049 Failure Symptoms (See Failure Analysis).
050 Federal Supply Classification (FSC) (See National Stock Number).
051 Federal Supply Code for Manufacturers (FSCM).
052 Figure Number (Figure No.).

Appendix B--Continued

053 Frequency.
054 Functional Group Code (FGC).
055 Height.
056 Indenture Code (Ind Cd).
057 Installation Factors.
058 Interface Adapters/Signal Conditioning Requirements.
059 Interchangeability Code (IC).
060 Intermediate Inspection (Time) (See Elapsed Time or Man-Hours).
061 Item Category Code (ICC).
062 Item Function.
063 Item Name.
064 Item Number (Item No.).
065 Justification (See Remarks/Recommendations/Justification).
066 Length.
067 Life Cycle Status.
068 Life Span.
069 Line Item Number.
070 Logistic Control Code.
071 LSA Control Number.
072 Long Reference Number Code (LRNC).
073 Maintainability Considerations Code.
074 Maintenance Action Code (MAC).
075 Maintenance Category Codes (See Source, Maintenance, and Recoverability Codes).
076 Maintenance Concept.
077 Maintenance Concept Impact.
078 Maintenance (Level) Codes (See Task Code).
079 Maintenance Task Distribution (Maint Task Dist).
080 Managing Command/Agency.
081 Man-Hours (Maintenance) per Operating Hour (M/H per Hour).
082 Man-Hours, Mean.
083 Man Identifier (MAN ID).
084 Manufacturers Model Number.
085 Manufacturers Name.
086 Manufacturer's Part Number.
087 Maximum Allowable Operating Time (MAOT).
088 Mean Active Maintenance Downtime (MAMDT).
089 Mean Mission Duration.
090 Mean Time Between Failures (MTBF).
091 Mean Time Between Maintenance Actions (MTBMA).
092 Mean Time Between Preventive Maintenance.
093 Mean Time to Repair (MTTR).
094 Measured (Time) (See Elapsed Time or Man-Hours).
095 Measurement Base Code.
096 Method of Acquiring Test Signal.
097 Military Rank/Rate/Grade (See Pay Grade, Uniformed Services).
098 Mission Profile Change (Time) (See Elapsed Time or Man-Hours).
099 Model Designator (See Type, Model, Service Designator).

Appendix B--Continued

100 Modification or Change.
101 National Item Identification Number (NIIN) (See National Stock Number).
102 National Stock Number (NSN).
103 Nearest Preferred Item Index.
104 Nearest TMDE Register Item Index.
105 NHA PLISN (See Provisioning List Item Sequence Number (PLISN)).
106 Nonrecurring (See Cost).
107 Number of Men per Task.
108 Number of Ranges.
109 Number of Systems Supported.
110 OHL/KIT/SET PLISN (See Provisioning List Item Sequence Number (PLISN)).
111 Operability Code (See Task Code.)
112 Operating and Support Cost.
113 Operators Manual.
114 Other Using Command/Agencies.
115 Packing Code (PCK).
116 Parameters Measured.
117 Pay Grade, Uniformed Services.
118 Percentage of Failure Rate (See Failure Analysis).
119 Percent Maximum Ripple.
120 Periodic Inspection (TIME) (See Elapsed Time or Man-Hour).
121 Phase.
122 Phased Provisioning Code (PPC).
123 Physical and Mental Requirements.
124 Physical Security/Pilferage Code (PSPC).
125 Pilot Rework/Overhaul Candidate (PR/O Cand).
126 Post Operative Inspection (Time) (See Elapsed Time or Man-Hours).
127 Predicted (Time) (See Elapsed Time or Man-Hours).
128 Preoperative Inspection (Time) (See Elapsed Time or Man-Hours).
129 Prior Item PLISN (See Provisioning List Item Sequence Number (PLISN)).
130 Procurement Concept Code.
131 Procurement Control Identifier (PCI).
132 Production Lead Time (PLT).
133 Proponent.
134 Provisioning Contract Control Number (PCCN).
135 Provisioning Control Code (PCC).
136 Provisioning List Item Sequence Number (PLISN).
137 Qualitative Maintainability Requirements.
138 Quantity.
139 Range.
140 Recommendations (See Remarks/Recommendations/Justification).
141 Recoverability Codes (See Source, Maintenance, and Recoverability Codes).
142 Recurring (See Cost).
143 Reference Designation.
144 Reference Designation Code (RDC).
145 Reference Number Category Code (RNCC).
146 Reference Number Format Code (RNFC).

Appendix B--Continued

147 Remarks.
148 Remarks/Recommendations/Justification.
149 Repair Cycle Turnaround Time (TAT REP CYCLE).
150 Repair Time (See Failure Analysis).
151 Rep or Sup PLISN (See Provisioning List Item Sequence Number (PLISN).
152 Replacement Task Distribution (REPL TASK DIST).
153 Reportable Item Control Code.
154 Requirements (For).
155 Requirements, Other.
156 Revision Code (Rev Code).
157 Safety Hazard Level Code.
158 Same as PLISN (See Provisioning List Item Sequence Number).
159 Security Clearance Code.
160 Self Testing Feature.
161 Sensors or Transducers.
162 Sequence Line Number (SLN).
163 Sequential Task Description.
164 Serial Number Effectivity.
165 Series Designator (See Type, Model, Series Designator).
166 Service Designator, Code.
167 Shelf Life Code (SL).
168 Significant Character Code (SCC).
169 Skill Level Code.
170 Skill Specialty Code (SSC).
171 Skill Specialty Evaluation Code (SS EVAL).
172 Source, Maintenance, and Recoverability Code (SMR).
173 Special Handling Code (SHC).
174 Specification Range of Readouts.
175 Specification Tolerance of Readouts.
176 Specification Type of Readouts.
177 Standards for Comparison.
178 Suffix Designator (See Type, Model, Series Designator).
179 Support Equipment Grouping Identification Number (See Requirements (For)).
180 Support and Test Equipment or Training Material Characteristics.
181 Support and Test Equipment or Training Material Description and Function.
182 Task Code.
183 Task Frequency.
184 Task Identification.
185 Task Interval Code (See Task Code).
186 Task Sequence Code (See Task Code).
187 Technical Data Package.
188 Technical Manual Change Number (TM Chg).
189 TM Designation.
190 TM Functional Group Code (TM FGC).
191 TM Indenture Code (TM Ind Cd).

Appendix B--Continued

192 TMDE Register Index Number.
193 TMDE Registration.
194 Test Point Description.
195 Test Points.
196 Tool Requirement Code (TOOL CD) (See Requirements (For)).
197 Total Cost (See Cost).
198 Total Elapsed Time (See Elapsed Time).
199 Total Item Changes (TIC).
200 Total Quantity Recommended (Total Qty Rec).
201 Training Equipment Requirements Code (TRN EQP) (See Requirements (For).
202 Training Source.
203 Turnaround (Time) (See elapsed time or man-hours).
204 Type Classification.
205 Type Designator (See Type, Model, Series Designator).
206 Type, Model, Series Designator.
207 Type of Construction.
208 Type of Item Code.
209 Unit Cost (See Cost).
210 Unit of Measure Code (UM).
211 Unit Price.
212 Unit Price Marker (UPM).
213 Units.
214 Unscheduled Maintenance (Time) (See Elapsed Time or Man-Hours).
215 Update Code.
216 Usable on Code.
217 Utilities Requirements.
218 Voltage Range.
219 Volume. See Length.
220 Watts.
221 Weight.
222 Width.
223 Work Area Code.
224 Work Breakdown Structure (WBS).
225 Work Unit Code (WUC).
226 Year of Fielding.

e. LOGISTIC SUPPORT ANALYSIS DATA ELEMENT DICTIONARY

DED NO.	STANDARD DATA ELEMENT TITLE / DEFINITION / DATA ITEM(S)	FIELD FORMAT: LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	CODE
001	Additional Reference Number	32	X	L	-	
	Numbers which provide additional information/cross referencing of a specific item. Additional Reference Numbers include: first precedent reference numbers, second precedent reference numbers, specification control numbers, drawing numbers and two-way interchangeable part numbers as defined in MIL-STD-1552.					
002	Additional Skill Requirements	1000	X	L	-	
	A description of the new skills that are required in order to operate and/or maintain the equipment.					
003	Additional Training Requirements	4000	X	L	-	
	A narrative description of the additional training required for operator, maintenance, and instructor personnel; includes the estimated lengths of courses, recommended site, justification for training and prerequisite requirements for students. Information will be supplied when Skill Specialty Evaluation Code "M" or "E" is indicated.					
004	Allocated (Time) (See Elapsed Time or Man-Hours)					
005	Alternative Action Code	1	A	F	-	
	A code to distinguish between identical items being considered under different conditions; e.g., different maintenance concepts.					
006	Annual Maintenance Man-Hours	5	N	R	1	
	The total maintenance man-hours expended per year, per item, segregated into scheduled and unscheduled time.					
007	Annual Number of Missions	6	N	R	-	
	The estimated or specified mean number of missions an item will be expected to accomplish in a year.					
008	Annual Operating Days	3	N	R	-	
	The mean number of days per year that a mission demand will be placed on an item.					

DED NO.	STANDARD DATA ELEMENT TITLE / DEFINITION / DATA ITEM(S)	FIELD FORMAT: LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	EXPLANATION / CODE
009	Annual Operating Requirements	6	N	R	-	
	The estimated or required yearly rate of usage of an item. Use with the data element Measurement Base Code.					
010	Aptitude/Qualification Test Score	2	N	R	-	
	The score, grade, or rating achieved by an individual on any test or examination expressed numerically (includes standard, converted, composite or percentage scores). See DOD 5000.12M, Reference Number TE-ST.					
011	Army Class Managing Activity (ACMA)	3	X	L	-	
	The Routing Identifier Code (RIC) assigned to the Army service manager responsible for item(s) of equipment. The RIC codes are given in AR 725-50.					
012	Authority for Modification or Change	10	X	L	-	
	The authorization document which provides for a change to the end item/ system, e.g. DA Modification Work Order, Depot Maintenance Work Requirement, etc.					
013	Availability (A)					
	The degree (expressed as a probability) to which an item is in the operable and commitable state at the start of the mission, when the mission is called for at an unknown (random) point in time. Availability is considered synonomous with operational readiness.					
	Data Use Identifiers					
a.	Availability, Achieved (A_a)	4	N	R	2	
	The probability that a system or equipment when used under stated conditions in an ideal support environment; i.e., available tools, parts, manpower, manuals, etc., will operate satisfactorily at any given time. Availability (achieved) excludes supply downtime and waiting or administrative downtime. It may be expressed as:					

$$A_a \% = \frac{MTBMA \times 100}{MTBMA + MAMDT}, \text{ where}$$

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE	FIELD FORMAT LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	
	DEFINITION					
	DATA ITEM(S)	EXPLANATION				CODE

MTBMA = mean time between maintenance actions and MAMDT = mean active maintenance downtime. For MTBMA entries expressed in measurement units other than operating hours, convert the units to operating hours per maintenance action.

b. Availability, Inherent (AI) — 4 — N — R — 2

The probability that a system or equipment, when used under stated conditions without consideration for any scheduled or preventive maintenance action and in an ideal support environment; i.e., available tools, parts, manpower, manuals, etc., will operate satisfactorily at any given time. Availability (inherent) excludes ready time, preventive maintenance action downtime, and waiting or administrative downtime. It may be expressed as:

$$AI\ \% = \frac{MTBF \times 100}{MTBF + MTTR}, \text{ where}$$

MTBF = mean time between failure, and MTTR = mean time to repair.

014 Basic Issue Item Category Code (BIC) — 1 — A — F — -

If the item is a basic issue item, integral component of the end item, additional authorized item or an expendable supply and/or materiel item, enter one of the following:

a.	Basic issue item	A
b.	Integral component of the end item	C
c.	Expendable supply and/or materiel	D
d.	Additional authorized item	E

015 Basic Issue Item List Quantity (BILI Qty) — 3 — N — R

The number of units to be delivered as part of the list identified by the basic issue category code.

016 Basis of Issue — 15 — X — F — -

The quantity of special tools authorized per density of end items being supported at organizational level. The block is subdivided into four fields as follows:

a.	Quantity Authorized	5	N	R	-
b.	BOI End Item	8	X	L	-
c.	Unit Level	1	A	F	-

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE	FIELD FORMAT LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	
	DEFINITION					
	DATA ITEM(S)	EXPLANATION				CODE

Codes for Unit Level are as follows:

(1)	Authorized per Lettered Company	A
(2)	Authorized per Service Battery/Company	B
(3)	Authorized per Numbered Battery/Company and similar HQ performing organizational maintenance for other units.	C
(4)	Authorized per battalion HQ when battalion has a service company	D
(5)	Authorized per battalion and brigade type HQ (Except when bn or bde has a service co).	E
(6)	Authorized per HQ of units above battalion level.	F
(7)	Reserved.	G
(8)	Reserved.	H

	d. Control Field	1	X	F	-
017	Calibration Interval	3	N	R	-

The frequency in days between which an item must be calibrated in order to operate properly.

018	Change Authority Number	15	X	L	-

A number which uniquely identifies an engineering order (EO), engineering change proposal (ECP), or modification work order (MWO).

019	Civilian Grade	4	X	F	-

A rating in a graduated scale of Federal civilian employee rank that is established and designated within a specified pay plan by law or regulation. DOD 5000.12M, Reference number GR-AD.

General Schedule	First two characters followed by numeric grade	GS
Wage Board (hourly)	Same	WB

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE	FIELD FORMAT				
		LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	
	DEFINITION					
	DATA ITEM(S)	EXPLANATION				CODE

020 Contractor Turnaround Time (CON TAT) — 3 — N — R — -

An expressed period of time measure in days from receipt of a failed item at the contractor's facility until the item is returned to the designated receiving point.

021 Conversion Factor — 4 — N — R — 2

Records the multiplier used to convert the operating time of the item under analysis to the operating time of the major system/ end item.

022 Coordinated Test Program Adequacy — 1 — A — F — -

A single letter code which indicates whether the coordinated test plan is adequate to verify the suitability of the requested item for military application.

Adequate	Y
Not Adequate	N

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE / DEFINITION / DATA ITEM(S)	FIELD FORMAT: LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	EXPLANATION / CODE
023	Cost	10	X	R	2	

The amount in US dollars paid, given, charged or engaged to be paid or given for item(s) and service.

When a unit of measure is thousands of dollars, an indicator "K" may occupy the right hand position. When a unit of measure is millions of dollars, an indicator "M" may occupy the right hand position.

A decimal point may be used to permit the listing of precise costs. The codes may be listed in left hand column to distinguish cost differences, if a Unit Price Marker is not provided.

Actual Cost		A
Estimated Cost		E
Recurring Cost	-occurrence repeating	R
Nonrecurring Cost	-one time occurrence	N
Total Cost		T
Unit Cost	-facility, support equipment, training material, tools, or repair parts.	U
Thousands of dollars		K
Millions of dollars		M

024	Daily Inspection (Time) (See Elapsed Time or Man-Hours)					
025	Data Sheet Status Code	1	A	F	-	

Indicates the completion status of an individual input data sheet.

In-process/revision	Data sheet incomplete and in-process.	W
Reviewed	In-process review action.	R
Approved	Approved by the ILS/LSAR team.	A
Completed	Data sheet complete.	C

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE / DEFINITION / DATA ITEM(S)	FIELD FORMAT: LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	EXPLANATION / CODE
026	Date	6	N	F	-	
	A notation which specifies a given day of the Gregorian Year. This notation provides for the identification of the year, the month, and the day in that sequence. DOD 5000.12M, Reference number DA-FA.					
027	Drawing Classification (Drg Class)	3	X	R	-	
	Indicates the Category and Form of the engineering drawings used in the analysis. The Intended Use Category is indicated in the first position, the Drawing Level in the second position, and the third position indicates whether the drawing is proprietary. Codes for Drawing Level are the numeric identifications indicated in MIL-D-10000A. The proprietary status and intended use will be as indicated below.					
	Intended Use Categories					
	Design Evaluation					A
	Interface Control					B
	Service Test					C
	Logistic Support					D
	Procurement (identical items)					E
	Procurement (interchangeable items)					F
	Installation					G
	Maintenance					H
	Government Manufacture					I
	Interchangeability Control					J
	Levels of Drawings					
	Conceptual and Developmental Design					1
	Production Prototype and Limited Production					2
	Production					3

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE	FIELD FORMAT LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	
	DEFINITION					
	DATA ITEM(S)	EXPLANATION				CODE

027 Drawing Classification (Dwg Class) Continued

Proprietary Status

Proprietary - Yes — Y

Nonproprietary - No — N

028 Drawing Number — 32 X L -

Assigned to a particular drawing by the design activity for identification purposes. Consists of letters, numbers or combinations of letters and numbers which may, or may not, be separated by dashes. See Chapter 400, MIL-STD-100B for numbering procedures and limitations shown below. Drawing numbers will not exceed 16 characters. Long reference number spacing is provided for drawing numbers which exceed 16 characters (LRNC).

The number is assigned to a particular drawing for identification purposes by the design activity with the following limitations:

a. Letters "I", "O", "Q", "S", "X", and "Z" shall not be used. Letters shall be upper case (capital).

b. Numbers shall be arabic numerals. Fractional, decimal, and Roman numerals shall not be used.

c. Blank spaces are not permitted.

d. Symbols such as: (), *, /, +, - shall not be used, except when referencing the Government or industry document whose identification contains such a symbol.

029 Duty Position Requiring a New or Revised Skill — 19 X L -

Title of an occupation for which a Skill Specialty Code has not been assigned.

030 Economic Analysis — 500 X L

A systematic approach to employing scarce resources in a most efficient and effective manner. If an economic analysis has not been completed a narrative explanation is required.

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE	FIELD FORMAT				
		LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	
	DEFINITION					
	DATA ITEM(S)	EXPLANATION				CODE

031 Educational Qualifications 1000 X L --

A narrative description of the educational prerequisites recommended to acquire the skill necessary to perform the task or attain the Skill Specialty Code.

032 Elapsed Time, Mean 5 N R AS

Time expended, regardless of the number of personnel working simultaneously. This does not include logistic delay time. The clock time in hours associated with an individual task step or substep may be categorized as follows:

a. Allocated.
The maximum time allowed to accomplish a task.

b. Predicted.
The estimated time required in the performance of a task.

c. Measured.
The actual total clock time recorded in the completion of a task from start to finish.

Data Use Identifiers:

Daily Inspection.

Preoperative Inspection.

Post Operative Inspection.

Intermediate Inspection.

Periodic Inspection.

Unscheduled Maintenance.

Turnaround.

Mission Profile Change.

Total Elapsed Time.

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE / DEFINITION / DATA ITEM(S)	FIELD FORMAT: LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	CODE

033 End Item Acronym Code — 6 X L -

A code which uniquely identifies the system/equipment end item. This code will be assigned by the procuring activity. It will remain constant throughout the item's life cycle. Examples are TOW, MICV, UTTAS, and ROLAND.

034 Environmental Considerations (See Qualitative Maintainability Requirements).

035 Essentiality Code (EC) — 1 N F

This code indicates the degree to which the failure of the part affects the ability of the end item to perform its intended operation. Codes are assigned as follows:

Failure to this part will render the item inoperable.	1
Failure to this part will not render the end item inoperable.	3
Item does not qualify for the assignment of code 1, but is needed for personnel safety.	5
Item does not qualify for assignment of code 1 but is needed for legal, climatic, or other requirements peculiar to the planned operational environment of the end item.	6
Item does not qualify for the assignment of code 1 but is needed to prevent impairment of or the temporary reduction of operational effectiveness of the end item.	7

036 Extended Unit Price — 12 N R 2

The total proposed or estimated price for an item found by multiplying the Total Quantity Recommended by the Recurring Cost and adding the Nonrecurring Cost to the product.

037 Facilities Design Criteria — 4000 X L -

A narrative definition of the facility design requirements necessary to support a specific Task Code applicable to an item. The design criteria are in terms such as axle loads, hoist requirements, and special handling, installation, storage, electrical, environmental or service requirements.

DED NO.	STANDARD DATA ELEMENT TITLE / DEFINITION / DATA ITEM(S)	FIELD FORMAT: LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	EXPLANATION / CODE
038	Facilities Installation Leadtimes	500	X	L	-	
	Provides facilities installation leadtime schedules for contractor produced and installed support and test equipment or training devices. Leadtimes are referenced to system/equipment delivery schedules rather than to calendar dates. Express in days, weeks, or months.					
039	Facilities Requirements	4000	X	L	-	
	A narrative definition giving the location of and the function(s) to be performed in a facility, which necessitates the need for a new facility or modification of an existing facility.					
040	Facility Category Code	6	N	L	-	
	Provides a method for identifying and classifying real property from the initial planning stages through the complete cycle of programing, budgeting, accounting, and reporting in the areas of acquisition, construction, inventory, and maintenance. Every reportable item of real property is considered a facility. A parcel of land is a facility, as is each building, structure, and utility constructed on or in the land. The three digit DOD Basic Category codes have been extended within the services by additional digits. The more definitive categorization is authorized by DOD for internal use within the DOD components. See AR 415-28, for codes.					
041	Facility Requirements Code (FAC) (See Requirements (For)).					
042	Facility Unit Cost Rationale	500	X	L	-	
	A narrative on variations to the appropriate unit cost contained in military construction pricing guides, in terms of differences because of unusual utilities requirements, or other special features. If no suitable unit cost is available, provide a unit cost estimate for each facility item.					
043	Facility Utilization	500	X	L	-	
	The facility utilization rate described in terms of number of tasks performed in facility, training sessions, flying hours, number of maintenance hours, and other appropriate designators per specified time period.					

DED NO.	STANDARD DATA ELEMENT TITLE	FIELD FORMAT LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	
	DEFINITION					
	DATA ITEM(S)	EXPLANATION				CODE

044 Fail Safe Requirements (See Qualitative Maintainability Requirements).

045 Failure Analysis

A. Failure Mode 48 X L -

A description of how the item will fail.

B. Failure Symptoms 200 X L -

An identification of the symptoms for each failure mode, that would assist in diagnosing the failure and isolating to the indenture level where repair is to be accomplished.

C. Failure Effect and Criticality 48 X L -

A description of the probable effects of failure for each failure mode. Include the criticality of the failure; e.g., completely inoperable, inoperable in some modes, or operable at a degraded level of performance.

D. Percentage of Failure Rate 3 N R 1

The ratio (expressed as a percentage) of the failure rate of any one failure mode to the total failure rate for all failure modes.

E. Repair Time 5 N R 2

The active repair time (mean elapsed time) for each failure mode expressed in hundredths of an hour.

046 Failure Effect and Criticality (See Failure Analysis).

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE	FIELD FORMAT				
		LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	
	DEFINITION					
	DATA ITEM(S)	EXPLANATION				CODE

047 Failure Factor

A factor used to indicate the number of expected failures of the item, expressed in failures per 100 end items for one year. Used to obtain such data as peacetime/wartime maintenance factors, geographical impact factors, etc.

A. Failure Factor I 6 N R -

Indicates the number of expected failures, which will require removal and replacement of the support item in a given next higher assembly per 100 end items per year. This is based on the known/estimated end item usage rate under peacetime conditions.

B. Failure Factor II 6 N R -

Indicates the number of expected failures, which will require removal and replacement of the support item in a given next higher assembly per 100 end items per year. This is based on a known/estimated end item usage rate under wartime conditions.

C. Failure Factor III 6 X F -

The block is divided into six subfields. The first five positions identify areas of deployment as follows: CONUS, Europe, Pacific, Southern Commands, and Alaska. The sixth position is code "W" to indicate that the item is subject to wearout; otherwise, it is left blank. This block is used to modify the failure factors for environmental condition by area of end item deployment. The codes for the first five positions are as follows:

No requirement for support item	Ø
.25 of Failure Factor (F/F)	A
.50 of F/F	B
.75 of F/F	C
1.00 of F/F	1
1.25 of F/F	2
1.50 of F/F	3
1.75 of F/F	4
2.00 of F/F	5
2.25 of F/F	6
2.50 of F/F	7
2.75 of F/F	8
3.00 of F/F	9

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE	FIELD FORMAT LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	
	DEFINITION					
	DATA ITEM(S)	EXPLANATION				CODE

048 Failure Mode (See Failure Analysis)

049 Failure Symptoms (See Failure Analysis)

050 Federal Supply Classification (FSC) (See National Stock Number)

051 Federal Supply Code for Manufacturers (FSCM) 5 X F -

Provides a nonsignificant code assigned to identify manufacturers. See Federal Cataloging Handbooks H4-1 and H4-2 for codes.

052 Figure Number (Figure No.) 4 X R -

Represents the illustration number within the applicable technical manual that includes the item to which it is assigned.

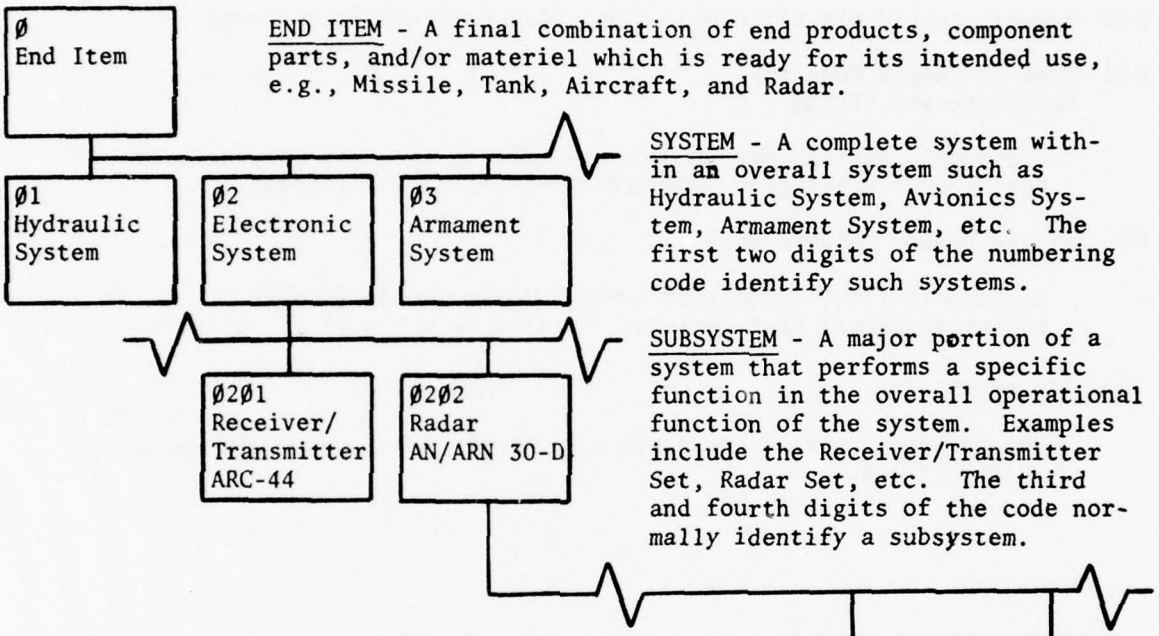
053 Frequency 6 N R

The number of periods or cycles, in hertz, for a given voltage or voltage range.

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE	FIELD FORMAT				
		LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	
	DEFINITION					
	DATA ITEM(S)	EXPLANATION				CODE

054 Functional Group Code (FGC) 11 X L -
A standard indexing system establishing a systematic breakdown of the end item or article into its functional systems, subsystems, components/assemblies, and parts. (Also see TM Functional Group Code). Example:



END ITEM - A final combination of end products, component parts, and/or materiel which is ready for its intended use, e.g., Missile, Tank, Aircraft, and Radar.

SYSTEM - A complete system within an overall system such as Hydraulic System, Avionics System, Armament System, etc. The first two digits of the numbering code identify such systems.

SUBSYSTEM - A major portion of a system that performs a specific function in the overall operational function of the system. Examples include the Receiver/Transmitter Set, Radar Set, etc. The third and fourth digits of the code normally identify a subsystem.

COMPONENT/ASSEMBLY - A number of parts or subassemblies or any combination thereof joined together to perform a specific function. Within the scope of this document, this term applies to items that cannot be *further disassembled for test or repair* without requiring shop facilities. Examples include signal data converter, antenna, amplifier assembly, etc. The fifth and sixth digits of the code normally are used to identify components and assemblies.

PART - One piece, or two or more pieces joined together, which is not normally subject to disassembly without destruction of designed use. The seventh and eighth digits identify parts.

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE / DEFINITION / DATA ITEM(S)	FIELD FORMAT: LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	EXPLANATION / CODE
055	Height	4	N	R	2	
	The height of the item in millimeters, feet, etc., as established by the data element Unit of Measure Code.					
056	Indenture Code (Ind Cd)	1	A	F	-	
	Indicates the relationship of a line item to the system or end item. The letter A, B, C, etc., is used to illustrate the lateral and descending "family tree" relationship of each line item to and within the system or end item and its discrete components (units), assemblies, subassemblies, and sub-subassemblies. This coding is used when the sequence of listing is in top-down or disassembly order. The breakdown listing will be specified by the procuring activity.					
057	Installation Factors	500	X	L	-	
	Any considerations required for the installation of support and test equipment, or training material, such as vibration and shock mounting requirements, special foundations, utilities connections, and environmental factors. Include any equipment necessary to install the item; e.g., cranes, hoists, lift trucks, transits, etc.					
058	Interfacing Adapters/ Signal Conditioning Requirements	200	X	L		
	A narrative description of all interface adapters or signal conditioning circuitry which is required for the item of TMDE to interface with an end item/system.					

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE	FIELD FORMAT				
		LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	
	DEFINITION					
	DATA ITEM(S)	EXPLANATION				CODE

059 Interchangeability Code (IC) 2 A F -

Identifies an item which: (1) Possesses such functional and physical characteristics as to be equivalent in performance, realiability, and maintainability, to another item of similar or identical purpose, and (2) Is capable of being exchanged for the other item (a) without selection for fit or performance, and (b) without alteration of the items themselves or of adjoining items except for adjustment. Normally used when an item previously listed is being replaced by a new item.

Signifies one-way interchangeability as follows: OW

(1) When used for a change to the original item, OW means that the original item may be used until exhausted.

(2) When used for the replacement item, OW means that the new item may be used to replace the original item.

Signifies that the original item and the replacement item are interchangeable with each other. TW

Signifies that the item is not interchangeable as follows: NI

(1) When used for the original item, NI means that the item is not interchangeable with the replacement item.

(2) When used for the replacement item, NI means that the replacement item is not interchangeable with the original item.

Signifies that the original item is interchangeable with the replacement item only if modified to the replacement item configuration and only in the new application. OM

Signifies that the original item is interchangeable in both the old and new application only if the original item is modified to the replacement configuration. TM

060 Intermediate Inspection (Time) (See Elapsed Time or Man-Hours)

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE	FIELD FORMAT LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	
	DEFINITION					
	DATA ITEM(S)	EXPLANATION				CODE
061	Item Category Code (ICC)	1	X	F	-	

Identifies the type of item under analysis. Indicates categories into which support and test equipment, spares, repair parts, etc, may be divided.

a. Peculiar support equipment and tools not currently in the DOD inventory assigned to units by authorization documents (e.g., TOE).

Peculiar Support Equipment	A
Peculiar Tools	B
Peculiar Test Equipment	C
Peculiar Handling Equipment	D

b. Peculiar support equipment and tools not currently in the DOD inventory assigned to units by equipment documents (e.g., RPSTL).

Peculiar Support Equipment	E
Peculiar Tools	1
Peculiar Test Equipment	2
Peculiar Handling Equipment	3

c. Common support equipment and tools currently in the DOD inventory assigned to units by equipment documents (e.g., RPSTL).

Common Support Equipment	H
Common Tools	4
Common Test Equipment	5
Common Handling Equipment	6

d. Common support equipment and tools currently in the DOD inventory assigned to units by authorization documents (e.g., TOE).

Common Support Equipment	J
Common Tools	K
Common Test Equipment	L
Common Handling Equipment	M

e. Bulk Items	Q
f. Training material not currently in the DOD inventory	S

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE	FIELD FORMAT: LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	
	DEFINITION					
	DATA ITEM(S)	EXPLANATION				CODE
061	Item Category Code (ICC) Continued					
	g. Training material currently in the DOD inventory					T
	h. End item					W
	i. Spare					X
	j. Repair part; component; assembly					Y
	k. Kit/Set					Z

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE / DEFINITION / DATA ITEM(S)	FIELD FORMAT: LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	EXPLANATION / CODE

062 Item Function — 4000 — X — L — -

A detailed description of the item's function, specifications and tolerances in the system being designed; e.g., "Supply 2 cu ft/ minute of nitrogen at 3000 psi for normal activation of pilot's canopy, nose and main landing gear extension, wheel brakes, and flap extension."

063 Item Name — 19 — X — L — -

The item name, as contained in Federal Cataloging Handbook H6-1, or the name assigned by the manufacturer in accordance with MIL-STD-100 if an applicable item name is not contained in the handbook. This data element also covers facilities. Abbreviations for item names will be in accordance with MIL-STD-12.

064 Item Number (Item No) — 4 — N — R — -

An index number assigned to an item included in an illustration within a technical manual.

065 Justification (See Remarks/Recommendations/Justification)

066 Length — 4 — N — R — 2

The length of the item in millimeters, feet, etc., as established by the data element Unit of Measure Code. When the volume, and not the dimensions, of the item is known, enter the volume in the length block and enter the appropriate Unit of Measure Code.

067 Life Cycle Status — 15 — X — L — -

The current equipment life cycle phase an item of equipment is in. The phases are identified as concept, validation, full scale development or production.

068 Life Span — 2 — N — R — -

The estimated useful life, in years, of an item of equipment.

069 Line Item Number — 6 — X — L — -

A unique number assigned to all items of equipment for which the Army has proponency. Line item numbers are provided in SB 700-20, Army Adopted/OTHER ITEMS SELECTED FOR AUTHORIZATION/LIST OF REPORTABLE ITEMS.

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE / DEFINITION / DATA ITEM(S)	FIELD FORMAT: LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	EXPLANATION / CODE
070	Logistic Control Code	1	A	F	-	
	A code assigned to Army adopted items and other items of materiel selected for authorization to provide a basis for logistical support decisions, i.e., procurement, overhaul, repair parts provisioning, requisitioning, and distribution.					
	Standard A					A
	Standard B					B
	Item previously type classified under earlier regulations and is still in the inventory (item has not yet been reclassified)					C
	Developmental					D
	Contingency and Training-Contingency					F
	Not separately type classified					N
	Obsolete					O
	Items exempt from Army type classification					R
	Contingency and Training - Training					S
	Limited Production - Test					T
	Limited Production - Urgent					U
071	LSA Control Number	11	X	L	-	
	A code that represents a hardware generation breakdown/disassembly sequence of system/equipment hardware including support and test equipment, training equipment, and installation (connecting) hardware. Each item in the system/equipment must be assigned an LSA Control Number to uniquely identify it to its next higher assembly for ADP processing and output report generation. Functional Group Codes (FGC), Work Breakdown Structure (WBS) codes, or Work Unit Codes (WUC) may be used as the LSA Control Number if it can satisfy the above criteria.					

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE	FIELD FORMAT LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	
	DEFINITION					
	DATA ITEM(S)	EXPLANATION ..				CODE

072 Long Reference Number Code (LRNC) 1 A F -

Provides for continuity when a reference number; e.g., Manufacturer's Part Number, Drawing Number, etc., exceeds 16 characters. The letter "A" will be used to indicate the first portion of the reference number and the letter "B" will be used to indicate the overflow.

073 Maintainability Considerations Code 1 A F -

Indicates whether design considerations for an item are adequate from the maintenance/maintainability viewpoint. Factors to be considered include standardization, accessibility, ease of maintenance, safety, test points, skills, training, etc.

Adequate	A
Not Adequate	N

074 Maintenance Action Code (MAC) 1 A F -

Indicates the required action to be taken at expiration of the Maximum Allowable Operating Time. The codes are as follows:

Condemn	C
Repair	R
Test and Repair	T

075 Maintenance Category Codes (See Source, Maintenance, and Recoverability Codes).

076 Maintenance Concept 4000 X L -

The broad, planned approach to be employed in sustaining the system/equipment at a defined level of readiness or in a specified condition in support of the operational requirement. Initially stated by the Government for design and support planning purposes, and expanded by contractor prepared inputs during full-scale development. Provides the basis for the Maintenance Plan. Usually includes guidelines pertaining to projected maintenance tasks, levels, and locations; organic/contractor maintenance workload mix; condition monitoring, fault isolation and testing approach; compatibility with existing support and test equipment, etc. May be influenced or modified by economic, technical or logistic considerations as the system/equipment development proceeds.

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE / DEFINITION / DATA ITEM(S)	FIELD FORMAT: LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	EXPLANATION / CODE

077 Maintenance Concept Impact — 1 — A — F — -

Indicates whether the maintenance concept will have an impact on the existing or planned facilities or cause a requirement for peculiar support and test equipment or tools.

Item Affected - Yes — Y

Not Affected - No — N

078 Maintenance (Level) Codes (See Task Code)

079 Maintenance Task Distribution (Maint Task Dist) — 10 — N — F — -

Indicates the percent of a reparable item expected to be repaired and returned to stock by a specified maintenance level. The first four fields represent the standard Army maintenance levels and the fifth field is the condemnation rate. The sum of the fields should equal 100 percent.

080 Managing Command/Agency — 12 — X — L — -

The name of the DARCOM major subordinate command or DA agency that has the integrated commodity management of an item of equipment, i.e., MIRCOM, TARCOM, TSARCOM, etc.

081 Man-Hours (Maintenance) per Operating Hour (M/H per Hour) — 5 — N — R — 1

a. Scheduled - Total maintenance man-hours expended for preventive maintenance divided by total operating hours.

b. Unscheduled - Total maintenance man-hours expended for corrective maintenance divided by total operating hours.

082 Man-Hours, Mean — 5 — N — R — AS

The sum of the working time of each individual required to perform a task step or substep, expressed in whole hours, and decimals (as specified). May be categorized as follows:

a. Allocated

The maximum number of man-hours allowed to accomplish a task.

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE	FIELD FORMAT LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	
	DEFINITION					
	DATA ITEM(S)	EXPLANATION				CODE

082 Man-Hours, Mean (continued)

b. Predicted

The estimated man-hours that will be required in the performance of a task.

c. Measured

The actual total man-hours expended in completion of a task.

Data Use Identifiers:

Daily Inspection.

Preoperative Inspection.

Post Operative Inspection.

Intermediate Inspection.

Periodic Inspection.

Unscheduled Maintenance.

Turnaround.

Mission Profile Change.

083 Man Identifier (Man ID) 1 A F -

Identifies each man required to perform the task. If a man is used to perform more than one task, the same character will identify him throughout the task analysis.

084 Manufacturers Model Number 10 X L -

The manufacturers identification of a piece of equipment.

085 Manufacturers Name 29 X L -

The name of the company or corporation which manufactures an item of equipment.

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE / DEFINITION / DATA ITEM(S)	FIELD FORMAT: LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	EXPLANATION / CODE

086 Manufacturers Part Number — 32 — X — L — -

Numbers assigned to uniquely identify a specific item. It may or may not be the same as the Drawing Number. Normally used with the data element Federal Supply Code for Manufacturers (FSCM).

087 Maximum Allowable Operating Time (MAOT) — 4 — X — F — -

Indicates the expressed period of time or number of events after which certain items will be replaced, overhauled, recalibrated, repaired, or inspected. Indicates the specific service life of an item. Use with the data element Maintenance Action Code. The block is divided as follows:

a. First two positions — applicable program units, i.e., 01-99

b. Third Position — appropriate multiplier code

1 x U/M	BLANK
10 x U-M	X
100 x U/M	C
1000 x U/M	M

c. Fourth Position — Measurement Base Code (See DED 095)

088 Mean Active Maintenance Downtime (MAMDT) — 6 — N — R — 1

The statistical mean of the individual elapsed times for all maintenance tasks, during a given period of time. The Mean Active Maintenance Downtime (MAMDT) or $\overline{M}$ is the weighted average of the mean corrective maintenance action time (Mean Time to Repair, MTTR) and the Mean Preventive Maintenance Action Time (MTPM). When the number of corrective maintenance actions (NC) and the number of preventive maintenance actions (NP) have been determined for a common reference time, the following formula may be used to calculate the mean active maintenance downtime:

$$\overline{M} = MAMDT = \frac{(MTTR \times NC) + (MTPM \times NP)}{NC + NP}$$

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE	FIELD FORMAT LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	
	DEFINITION					
	DATA ITEM(S)	EXPLANATION				CODE

089 Mean Mission Duration 5 N R -

Identifies the length of a mission for the item under analysis. Use with the data element Measurement Base Code.

090 Mean Time Between Failures (MTBF) 6 N R 1

For a particular interval, the total functional life of a population of an item divided by the total number of failures within the population during the measurement interval. The definition holds for time, rounds, miles, events, or other measure of life units.

091 Mean Time Between Maintenance Action (MTBMA) 6 N R 1

The mean of the distribution of the time intervals between maintenance actions, either preventive, corrective, or both.

092 Mean Time Between Preventive Maintenance 6 N R 1

The mean of the distribution of the time intervals between preventive maintenance actions. MIL-STD-712B.

093 Mean Time to Repair (MTTR) 6 N R 1

The total corrective maintenance time divided by the total number of corrective maintenance actions during a given period of time.

094 Measured (Time) (See Elapsed Time or Man-Hours)

095 Measurement Base Code 1 A F -

Defines the unit of measure for a particular operating time period or number of events.

Hours	H
Days	D
Months	T
Years	Y

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE / DEFINITION / DATA ITEM(S)	FIELD FORMAT: LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	EXPLANATION / CODE

095 Measurement Base Code (continued)

Miles	M
Rounds	R
Starts	S
Landings	L

096 Method of Acquiring the Test Signal — 1000 X L -

A narrative description of how the test signal is obtained from the system/equipment under test.

097 Military Rank/Rate/Grade (See Pay Grade, Uniformed Services)

098 Mission Profile Change (Time) (See Elapsed Time or Man-Hours).

099 Model Designator (See Type, Model, Series Designator)

100 Modification or Change — 1 A F -

A single letter code indicating whether or not the need for TMDE is a result of a modification or change to the end item. Enter "Y" for yes or "N" for no.

101 National Item Identification Number (NIIN) (See National Stock Number)

102 National Stock Number (NSN) — 20 X F -

A number assigned under the Federal Cataloging Program and/or North Atlantic Treaty Organization (NATO) codification of equipment system to each approved item identification which provides a unique identification of an item of supply within a specified Federal Supply Classification. A data chain consisting of the four digit Federal Supply Classification and nine digit National Item Identification Number in that order. It may also have a two-character Dual Cognizance Code and one-character Material Control Code prefix, and a two-character Special Material Identification Code suffix. The configuration of the total NSN would be:

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE	FIELD FORMAT LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	
	DEFINITION					
	DATA ITEM(S)	EXPLANATION				CODE

102 National Stock Number (NSN) (continued)

a.	Dual Cognizance Code	2	A	F	-
b.	Material Control Code	1	A	F	-
c.	Federal Supply Classification (FSC)	4	N	F	-
d.	National Item Identification Number (NIIN)	9	N	F	-
e.	Suffix Code	4	X	F	-

103 Nearest Preferred Item Index 7 X F -

The number of the item in the DA TMDE preferred items list which best meets the TMDE requirements.

104 Nearest TMDE Register Item Index 7 X F -

The number of the item in the DA TMDE Register which best meets the TMDE requirements.

105 NHA PLISN (See Provisioning List Item Sequence Number (PLISN))

106 Nonrecurring (See cost)

107 Number of Men Per Task 2 N R -

The total number of men required with a particular SSC, whether full or part time, to perform a given task. An entry is required for each task listed.

108 Number of Ranges 3 X R -

The number of ranges available/planned for the item of TMDE within each parameter measured.

109 Number of System Supported 6 N R -

The average number of systems or end items supported by a maintenance level.

DED NO.	STANDARD DATA ELEMENT TITLE	FIELD FORMAT: LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	
	DEFINITION					
	DATA ITEM(S)	EXPLANATION				CODE

110 OHL/KIT/SET PLISN (See Provisioning List Item Sequence Number (PLISN))

111 Operability Code (See Task Code)

112 Operating and Support Cost 7 N R -

The projected annual ownership cost in dollars per end item of TMDE, averaged over its expected useful life.

113 Operators Manual 20 X L -

The TM designation of the military operators manual or the number of the commercial manual applicable to the item.

114 Other Using Command/Agencies (See Managing Command/Agency)

115 Packing Code (PCK) 1 A F -

Indicates whether or not the measurements and weight of an item include packing. The codes are as follows:

Includes packing	P
No packing	U

116 Parameters Measured 12 X L -

A list of the type of characteristics (e.g., Volts DC, Hertz, etc.) measured or required to be measured by an item of TMDE.

117 Pay Grade, Uniformed Services 3 X F -

Identifies military personnel by rank/rate/grade. Data chain composed of two standard data elements, Military Personnel Class and Pay Level Serial Number, in that order. DOD 5000.12M, Reference number PA-SN.

EXAMPLES

Enlisted - EØ1 through EØ9
Warrant - WØ1 through WØ4
Officer - OØ1 through O11
Cadet - CØØ
Cadet (Aviation) - EØØ

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE / DEFINITION / DATA ITEM(S)	FIELD FORMAT: LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	EXPLANATION / CODE
118	Percentage of Failure Rate (See Failure Analysis)					
119	Percent Maximum Ripple	5	N	R	-	
	The percent maximum ripple of the output voltage of the power source available to operate the TMDE.					
120	Periodic Inspection (Time) (See Elapsed Time or Man-Hours)					
121	Phase	1	N	F	-	
	The number of simultaneously applied A.C. voltage sources for a given voltage range.					
122	Phased Provisioning Code (PPC)	1	A	F	-	
	Indicates whether an initial support item (spare or repair part) is recommended for phased provisioning under MIL-STD-1517.					
	Recommended					P
	Not Recommended					BLANK
123	Physical and Mental Requirements	1000	X	L	-	
	Identifies any unique physical or mental personnel attributes required or recommended as prerequisites to full qualification in the applicable task.					

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE	FIELD FORMAT LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	
	DEFINITION					
	DATA ITEM(S)	EXPLANATION				CODE
124	Physical Security/ Pilferage Code (PSPC)	1	A	F	-	

A one position alphabetic code which indicates the security classification or pilferage control for physical assets. Only unclassified items may be recorded to reflect that pilferage controls are required. See DOD 4100.39M and DOD 4130.2M.

Confidential - Former Restricted Data	A
Confidential - Restricted Data	B
Confidential	C
Confidential - Cryptologic	D
Secret - Cryptologic	E
Top Secret - Cryptologic	F
Secret - Former Restricted Data	G
Secret - Restricted Data	H
Pilferage Code - May be applied to unclassified (U) items only	
Top Secret - Former Restricted Data	K
Top Secret - Restricted Data	L
Secret	S
Top Secret	T
Unclassified	U

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE	FIELD FORMAT				
		LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	
	DEFINITION					
	DATA ITEM(S)	EXPLANATION				CODE

124 Physical Security/
Pilferage Code (continued)

Pilferage (Code J) items may be further categorized by use of the following codes:

Aircraft engine equipment and parts	I
Hand tools and shop equipment	M
Firearms	N
An item which is a drug or other substance determined by the Director, BNDD, Department of Justice, to be designated schedule symbol III, IV, or V as defined in the Controlled Substance Act of 1970 and other items requiring secure storage.	Q
Alcohol, alcoholic beverages, precious metals, or a drug or other substance determined by the Director, BNDD, Department of Justice, to be designated schedule symbol II as defined in the Controlled Substance Act of 1970 and other items requiring vault storage.	R
Individual clothing and equipment.	V
Office machines.	W
Photographic equipment and supplies.	X
Communications/electronic equipment and parts.	Y
Vehicular equipment and parts.	Z

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE	FIELD FORMAT				
		LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	
	DEFINITION					
	DATA ITEM(S)	EXPLANATION				CODE

125 Pilot Rework/Overhaul Candidate (PR/O CAND) 1 A F -

Indicates selection status of certain complex assemblies/components considered for PR/O as a part of the preoperational support program. Items nominated are those which require additional skills, training, support and test equipment, facilities, and technical data to insure a rework/overhaul capability concurrent with Government support of the end item. Consider both intermediate and depot level rework/overhaul items.

Nominated - Yes Y

Not Nominated - No N

Approved as candidate by procuring activity A

126 Post Operative Inspection (Time) (See Elapsed Time or Man-Hours).

127 Predicted (Time) (See Elapsed Time or Man-Hours).

128 Preoperative Inspection (Time) (See Elapsed Time or Man-Hours).

129 Prior Item PLISN (See PLISN).

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE / DEFINITION / DATA ITEM(S)	FIELD FORMAT: LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	EXPLANATION / CODE
130	Procurement Concept Code	1	N	F	-	
	A code indicating the extent to which an item of supply is competitively procured. This code reflects the decision on the purchasing technique to be employed from a planned procurement review.					
	Not established.					Ø
	Item screened and found to be already competitive.					1
	Item screened and determined for the first time to be suitable for competitive procurement.					2
	Item screened and found to be procured directly from the actual manufacturer or vendor, including a prime contractor who is the actual manufacturer.					3
	Item screened and determined for the first time to be suitable for direct purchase from the actual manufacturer or vendor, rather than the original prime contractor for the end items which these parts support.					4
	Item screened and determined not suitable for competitive procurement or direct purchase and which, therefore, continue to be procured from a prime contractor who is not the actual manufacturer.					5
131	Procurement Control Identifier (PCI)	1	X	F	-	
	Indicates the procurement/technical control retention status for the items. Codes will be specified by the procuring activity.					
132	Production Lead Time (PLT)	2	N	R	-	
	Indicates the computed or expected time interval in months between placement of a new contract and shipment of the first deliverable quantity.					
133	Proponent	12	X	L	-	
	The military service which is the proponent of the assigned NSN for the item of TMDE.					

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE / DEFINITION / DATA ITEM(S)	FIELD FORMAT LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	CODE
134	Provisioning Contract Control A nonsignificant number used to identify a specific end item(s) and/or contract. The number is assigned by the procuring activity.	6	X	L	-	
135	Provisioning Control Code (PCC) A code which uniquely identifies an end item model throughout its life cycle. Codes will be specified by the procuring activity.	3	X	F	-	
136	Provisioning List Item Sequence Number (PLISN) Provides provisioning documentation sequential line item control, commencing with the first line on the first page of the first section of the format, and continuing numerically to the last item on the last page of the last section of the format. The first four digits are used for sequential numbering of line items on the list. Construction of the balance of the coding will be provided by the procuring activity. Data Use Identifiers: PLISN, Next Higher Assembly. PLISN, Overhaul/Kit/Set. PLISN, Prior Item. PLISN, Replaced or Superseded. PLISN, Same As.	6	X	L	-	

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE / DEFINITION / DATA ITEM(S)	FIELD FORMAT: LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	EXPLANATION / CODE
137	Qualitative Maintainability Requirements	4000	X	L	-	
	Specifies maintainability design constraints and characteristics that must be considered during the design process.					
	a. Fail Safe Requirements	2000	X	L	-	
	A narrative definition of required fail safe characteristics; i.e., redundancy, back-up systems, built-in test and warning equipment, fail safe provisions necessary to protect the equipment from serious damage after failure, and design features to prevent injury to personnel subsequent to equipment failure.					
	b. Environmental Considerations	2000	X	L	-	
	A narrative definition of the applicable environmental conditions within which the item can operate satisfactorily. This information should include limitations, sensitivity factors, etc., that can affect the performance and reliability of the item installed in the system/equipment. Limiting factors such as the following should be considered; shock limits, vibration limits, ambient temperature ranges, operating temperatures in area (compartment) where item is installed in the system/equipment, humidity factors, altitude factors, magnetic interference, dust and dirt factors, salts or other corrosive atmospheres, and light sensitivity.					
138	Quantity					
	A representative of the number of units of anything that has the property of being measurable in dimensions, amounts, etc.					
	Data Use Identifiers:					
	Quantity, Overhaul (OHL Qty)	3	N	R	-	
	Quantity per Assembly (Qty/Assy)	4	N	R	-	
	Quantity per End Item (Qty/EI)	5	N	R	-	
	Quantity per Task (Qty per Task)	5	N	R	-	

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE / DEFINITION / DATA ITEM(S)	FIELD FORMAT: LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	EXPLANATION / CODE
138	Quantity (continued)					
	Quantity, Estimated Total	7	N	R	-	
	Quantity, Initial	7	N	R	-	
	Quantity Procured (Qty Procured)	6	N	R	-	
	Quantity Shipped (Qty Shipped)	6	N	R	-	
	Quantity, Unit Pack (QUP)	3	N	R	-	
139	Range	16	N	R	-	
	A two-part sequence identifying the lower and upper value of a parameter to be measured by an item of TMDE.					
140	Recommendations (See Remarks/Recommendations/Justification)					
141	Recoverability Codes (See Source, Maintenance, and Recoverability Codes)					
142	Recurring (See Cost)					
143	Reference Designation	64	X	L	-	
	Letters or numbers, or both, used to uniquely identify and locate discrete units, portions thereof, and basic parts of a specific set. (A reference designation is not a letter symbol, abbreviation, or functional designation for an item). For electrical and electronic parts and equipment, the reference designation number is in accordance with ANSI Y32.16, utilizing either the Unit (preferred) or Block Numbering Method.					

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE	FIELD FORMAT				
		LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	
	DEFINITION					
	DATA ITEM(S)	EXPLANATION				CODE
144	Reference Designation Code (RDC)	1	A	F	-	

Indicates the type of data entered in the Reference Designation field:

Assemblies that are separable or repairable identified with a Reference Designation in accordance with ANSI Y32.16 (does not apply to detail parts within the assembly).	A
Same as A, except this code is to be assigned to assemblies that are inseparable or nonrepairable.	U
Items identified with a figure and index number in the Reference Designation block.	F
Installation and checkout items that are inseparable or nonrepairable.	C
Installation and checkout items that are separable or repairable.	Z

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE / DEFINITION / DATA ITEM(S)	FIELD FORMAT: LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	CODE
145	Reference Number Category Code (RNCC)	1	X	F	-	
	Indicates the category or relationship of the reference number to a National Stock Number or other reference number. See MIL-STD-1552.					
	Source control reference.					1
	Definitive Government specification or standard designator reference.					2
	Design control reference.					3
	Secondary reference.					5
	Specification control reference.					7
	Altered item reference.					E
	Selected item reference.					F
	Drawings.					G
146	Reference Number Format Code (RNFC)	1	N	F	-	
	Identifies the format mode of a reference number as follows:					
	Number is formatted as originally configured/expressed on originating document (in-the-clear).					1
	Number is formatted in accordance with Federal Manual for Supply Cataloging M1-6.					2
	Number format is unknown as to whether number is restructured or "in-the-clear."					3
147	Remarks	12	X	L	-	
	Explanatory type data which is considered essential to the provisioning process.					

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE	FIELD FORMAT LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	
	DEFINITION					
	DATA ITEM(S)	EXPLANATION				CODE

148 Remarks/Recommendations/Justification

a. Remarks 2000 X L -

Statement or explanation of a condition not readily identified in a given data element.

b. Recommendations 2000 X L -

Narrative recommendations for improving the support posture of the item based on logistic support analysis. A recommendation may be related to design changes, changes to the maintenance concept, etc.

c. Justification 4000 X L -

A narrative definition of major factors which (a) led to the decision that additional facilities, personnel, training, training material, support and test equipment, etc., are required, or that (b) provided the basis for establishing the maintenance concept or making a major program decision.

149 Repair Cycle Turnaround Time 12 N R -
(TAT REP CYCLE)

Indicates the expected elapsed time in whole days from receipt of a reparable item at the maintenance level capable of repair until the item is repaired and ready for reissue.

150 Repair Time (See Failure Analysis)

151 Rep or Sup PLISN (See Provisioning List Item Sequence Number (PLISN)

152 Replacement Task Distribution 15 N R -
(REPL TASK DIST)

Indicates the actual percent of a replaceable item expected to be removed and installed by the specified maintenance level. The sum of the fields should equal 100 percent.

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE / DEFINITION / DATA ITEM(S)	FIELD FORMAT: LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	EXPLANATION / CODE
153	Reportable Item Control Code	1	N	F	-	
	A code assigned by the item manager to those items for which the field is required to report their asset position.					
154	Requirements (For)	6	A	F	-	
	a. Facility Requirements Code (FAC)	1	A	F	-	
	Indicates whether a new or modified facility is required. If coded "Y" a Facility Description and Justification, Data Sheet F will be prepared.					
	Required - Yes					Y
	Not Required - No					N
	b. Training Equipment Requirements Code (TRN EQP)	1	A	F	-	
	Denotes whether training material is required to prepare the operator or maintenance man to perform a given task.					
	Required - Yes					Y
	Not required - No					N
	c. Support Equipment Grouping Identification Number	3	N	F	-	
	A contractor assigned number to facilitate the aggregation of requirements for similar or identical support or test equipment types; e.g., 100=voltmeters; 200=wattmeters, etc.					
	d. Tool Requirement Code (TOOL CD)	1	A	F	-	
	Indicates when tools are required and whether tools are common or peculiar.					
	Peculiar Tool					S
	Common Tool					C
	Both Peculiar and Common Tools					B
	Not Required					N

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MAINTENANCE OF SUPPLIES AND EQUIPMENT, AMC GUIDE TO LOGISTIC SU--ETC(U)
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Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE / DEFINITION / DATA ITEM(S)	FIELD FORMAT: LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	EXPLANATION / CODE
155	Requirements, Other	1000	X	L	-	
	A narrative description of any additional facility support requirements such as, D.C. voltage, water, oil, air, etc. which is needed to operate an item of TMDE.					
156	Revision Code (Rev Code)	1	A	F	-	
	Indicates, in alphabetical sequence, the revision status of the input data sheet.					
	First change					A
	Second change					B
	etc.					etc.
157	Safety Hazard Level Code	1	N	F	-	
	In conjunction with a specific Task Code, identifies existing or potential conditions where personnel error, environment, design characteristics, procedural deficiencies, or subsystem or component failure or malfunction may cause personnel injury or system damage or loss. See MIL-STD-882 for definitions of the four Hazard Level Categories and their respective codes.					
	Negligible					1
	Marginal					2
	Critical					3
	Catastrophic					4
158	Same as PLISN (See Provisioning List Item Sequence Number (PLISN)).					

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE / DEFINITION / DATA ITEM(S)	FIELD FORMAT: LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	EXPLANATION / CODE
159	Security Clearance Code	1	N	F	-	
	A certification by national authority to indicate that a person has been investigated and is eligible for access to classified matter to the extent stated in the certification.					
	Top Secret					1
	Secret					2
	Not Required					3
160	Self Testing Feature	6	X	L	-	
	Identifies whether an item of TMDE has manual or automatic self test capability or no self test capability.					
161	Sensors or Transducers	1	A	F	-	
	A single letter code indicating whether or not the end item has permanently installed sensors or transducers.					
	Sensors Installed					Y
	No Sensors					N
162	Sequence Line Number (SLN)	2	N	R	-	
	Identifies the sequence of steps required to satisfy each task.					
163	Sequential Task Description	500	X	L	-	
	A narrative description of the complete effort expended to accomplish a specific maintenance or operator task. Description will include details as to removal of connectors or attachments, checkout, fault isolation, and safety precautions. Details should include procedures, tolerances, qualifying notes, special training required, etc. All requirements for power, compressed air, and environmental considerations will be specified. This narrative will be entered on a step by step basis.					

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE	FIELD FORMAT LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	
	DEFINITION					
	DATA ITEM(S)	EXPLANATION				CODE

164 Serial Number Effectivity 20 N R -

A two-part sequence identifying the serial numbers of a specific group of items to which the data sheet applies. The entry is divided into effectivity "from" (10 digits) and effectivity "to" (10 digits). For single serial number effectivity, the serial number will be repeated to indicate a span of one. When the ending number is unknown, "SUB" (subsequent) will be entered in the serial number "to" data field.

165 Series Designator (See Type, Model, Series Designator)

166 Service Designator Code 1 A F -

Identifies the military service or nonmilitary major governmental agency having jurisdiction over or executive management responsibility for the acquisition.

Army	A
Air Force	F
Navy	N
Marines	M
All military	X
FAA	B
Coast Guard (Treasury Dept)	C
NASA	S

167 Shelf Life Code (SL) 1 X F -

Indicates whether an item is subject to deterioration or perishability. When that is so, indicates time limitations, measured from the date of manufacture, after which the item may not be suitable for issue. See DOD 4100.39-M and DOD 4130.2M.

168 Significant Character Code (SCC) 1 X F -

Indicates whether a long part number has been reversed in order to place the significant characters in the first 16 positions. An "X" indicates the part number has been reversed.

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE	FIELD FORMAT LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	
	DEFINITION					
	DATA ITEM(S)	EXPLANATION				CODE
169	Skill Level Code	1	A	F	-	
	Indicates the skill level required to accomplish each maintenance task.					
	Basic	Applies to the qualifications of personnel of pay grades E-4 and below.				B
	Intermediate	Applies to the qualifications of personnel pay grade E-5.				I
	Advanced	Applies to the qualifications of personnel of pay grades E-6 and above.				A
	Officer	Not Applicable.				
170	Skill Specialty Code (SSC)	7	X	L	-	
	Describes the maintenance or operator skill required to accomplish the task. Codes are specified in publications listed below.					
	OFFICER	AR 611-101				
	WARRANT OFFICER	AR 611-112				
	ENLISTED	AR 611-201				
	CIVILIAN	DA CPR 502 FPM Supplement 512-1, Civil Service Commission, Job Grading Standard				

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE / DEFINITION / DATA ITEM(S)	FIELD FORMAT: LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	EXPLANATION / CODE
171	Skill Specialty Evaluation Code (SS Eval)	1	A	F	-	

Denotes the adequacy of the identified Skill Specialty Code (SSC) With regard to the specific skills and knowledge required to accomplish the identified task. Used as a flag to indicate the requirement for additional training. When SS evaluation is coded "M" or "E", a G Data Sheet is required to fully describe and justify the additional skill and training requirement.

SS is adequate	A
SS needs Modification (additional training)	M
New SS should be established	E

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE / DEFINITION / DATA ITEM(S)	FIELD FORMAT: LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	EXPLANATION / CODE
172	Source, Maintenance, and Recoverability Codes (SMR)	6	A	F	-	
	Uniform codes assigned to all support items early in the acquisition cycle to convey maintenance and supply instructions to the various logistic support levels and using commands. Codes are assigned based on the logistic support planned for the end item and its components. A data chain composed of three data elements, Source Code, Maintenance Category Code and Recoverability Code in that order. See AR 700-82 for codes.					
	a. Source Codes	2	A	F	-	
	Assigned to indicate the source of acquiring items for the maintenance of end items; i.e., procured and stocked, manufactured or assembled. Codes occupy first and second positions of the uniform format.					
	b. Maintenance Category Codes	2	A	F	-	
	Assigned to indicate the maintenance levels authorized to perform the required maintenance functions. Codes occupy the third and fourth positions of the uniform format. First space indicates the lowest level of maintenance authorized to remove, replace, and use the item. Second space indicates whether the item is to be repaired and identifies the lowest level of maintenance with the capability to perform complete repair.					
	c. Recoverability Codes	2	A	F	-	
	Assigned to indicate the disposition action on unserviceable items. Codes occupy the fifth and sixth positions of the uniform format. Enter code in first space. The second space is reserved for procuring activity use.					
173	Special Handling Code (SHC)	1	X	F	-	
	A significant code assigned to identify items for airlift which require special handling or reporting. Special handling codes will be provided by the procuring activity as required.					

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE / DEFINITION / DATA ITEM(S)	FIELD FORMAT: LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	CODE
174	Specification Range of Readouts Specifies the upper and lower limits or range of values that the support and test equipment readout(s) will be required to measure and/or indicate. Indicates the designed range(s) or specific value(s).	1000	X	L	-	
175	Specification Tolerance of Readouts Specifies the indicating and readability accuracy of the support and test equipment readout(s). Indicates the allowable deviation from the nominal, defined by the manufacturer or required by the procuring activity.	1000	X	L	-	
176	Specification Type of Readouts Specifies the type of readout(s) to be included in the support and test equipment; e.g., digital, dial, chart.	1000	X	L		
177	Standards for Comparison A narrative description of the standards against which calibration of the TMDE is compared.	1000	X	L	-	
178	Suffix Designator (See Type, Model, Series Designator)					
179	Support Equipment Grouping Identification Number (See Requirements (For))					

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE / DEFINITION / DATA ITEM(S)	FIELD FORMAT: LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	EXPLANATION / CODE
180	Support ant Test Equipment or Training Material Characteristics	1000	X	L	-	
	A narrative definition of the operational characteristics and capabilities of the selected support and test equipment or training material. These characteristics are generally in the same terms as those used to define the functions of the selected items.					
181	Support and Test Equipment or Training Material Description and Function	1000	X	L	-	
	A narrative definition of the performance, physical, installation, etc., parameters of the support and test equipment or training material necessary to support the Task Code identified. Includes all pertinent information concerning the type of measurements to be performed, parameters to be evaluated, accuracy, stability, requirements of measurements, etc.					

DED NO.	STANDARD DATA ELEMENT TITLE	FIELD FORMAT LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	
	DEFINITION					
	DATA ITEM(S)	EXPLANATION				CODE

182 Task Code 7 X F -

Uniquely identifies each maintenance or operator task for a particular item. Used to identify and relate associated analysis data to the specific requirements. A data chain made up of the following data elements:

a. Task Function Code 1 A F -

Denotes any one of a number of specific maintenance, operator, or supporting functions necessary to the operation and maintenance of an item.

Inspect	A
Test	B
Service	C
Adjust	D
Align	E
Calibrate	F
Install	G
Remove and Replace	H
Repair	J
Overhaul	K
Rebuild	L
Mission Profile Change	M
Fault Location	N
Operate	O
Lubricate	P
Disassemble/Assemble	Q

DED NO.	STANDARD DATA ELEMENT TITLE	FIELD FORMAT				
		LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	
	DEFINITION					
	DATA ITEM(S)	EXPLANATION				CODE

182 Task Code (Continued)

b. Task Interval Code 1 A F -

Identifies the scheduled or unscheduled timing of the task occurrence.

Preoperative/Preflight	A
Scheduled	B
Daily	C
Intermediate/Phase Inspection (Minor)	D
Periodic/Phase Inspection (Major)	E
Special	F
Unscheduled	G
Post Operative/Post Flight	H
Emergency	J
Normal	K
Weekly	L
Quarterly	M
Semiannually	N
Monthly	P
Calendar	Q
Overhaul/Rework	R

DED NO.	STANDARD DATA ELEMENT TITLE	FIELD FORMAT LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	
	DEFINITION					
	DATA ITEM(S)	EXPLANATION				CODE

182 Task Code (Continued)

c. Maintenance (Level) Codes 3 A F

Codes assigned to support items to indicate the maintenance levels authorized to perform the required maintenance functions.

Crew/Operator	C
Organizational/Aviation Unit Maintenance (AVUM)	O
Intermediate/Direct Support/Afloat/Aviation Intermediate Maintenance (AVIM)	F
Intermediate/General Support/Ashore	H
Intermediate/Ashore & Afloat (Navy)	G
Depot/Specialized Repair Activity/Shipyards	D
Not Applicable	X

d. Operability Code 1 A F

A code used to indicate the operational status of the item during the maintenance task.

System Inoperable during Equipment Maintenance	A
System Operable during Equipment Maintenance	B
Turnaround	T
Off-Equipment Maintenance	Y

e. Task Sequence Code (Task Seq Code) 1 X F -

Uniquely identifies a Task Code if the combination of Task Function, Task Interval, and Maintenance (Level) are insufficient. Use letter A-Z and numbers 1-9 as appropriate.

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE / DEFINITION / DATA ITEM(S)	FIELD FORMAT: LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	CODE
	EXPLANATION					

183 Task Frequency — 5 — N — R — 2

The frequency of performance or occurrence of the task identified by the Task Code. Expressed as the number of annual occurences based on the annual system operating requirements. For example, the frequency of monthly inspection would be recorded as Ø12.ØØ.

184 Task Identification — 40 — X — L — -

A narrative description of the task to be performed; e.g., "service strut" or, "replace brake assy."

185 Task Interval Code (See Task Code)

186 Task Sequence Code (See Task Code)

187 Technical Data Package — 250 — X — L — -

Identifies whether or not an adequate technical data package is available for procurement of TMDE. If it is not adequate then a narrative description of all deficiencies would be entered.

188 Technical Manual Change Number (TM Chg) — 2 — N — R — -

Indicates the most current change that has been made to a TM.

189 TM Designation — 20 — X — L — -

The structured identification code assigned to a technical manual with one or more end items of equipment.

190 TM Functional Group Code (TM FGC) — 11 — X — L — -

An indexing system establishing a systematic breakdown of the end item or article into its functional groups, basic system, installations, assemblies, or component for use in technical manuals.

191 TM Indenture Code (TM Ind Cd) — 1 — X — F — -

Indents repair part records in a TM to depict disassembly parts relationship within a figure of text.

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE / DEFINITION / DATA ITEM(S)	FIELD FORMAT: LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	EXPLANATION / CODE
192	TMDE Register Index Number	7	X	F	-	
	A seven digit index number assigned to each item in DA Pamphlet 700-20, DA TMDE Register.					
193	TMDE Registration	1	A	F	-	
	A single letter code indicating whether or not the TMDE has been registered in the DA TMDE Register.					
	Registered					Y
	Not Registered					N
194	Test Point Description	250	X	L	-	
	A narrative description of the available or planned test points on the end item or if no test points are available an explanation of how the end item will be tested.					
195	Test Points	1	A	F	-	
	A single letter code indicating whether or not test points are available on the end item.					
	Test Points					Y
	No Test Points					N
196	Tool Requirement Code (Tool CD) (See Requirements (For))					
197	Total Cost (See Cost)					
198	Total Elapsed Time (See Elapsed Time, Mean)					
199	Total Item Changes (TIC)	2	N	R	-	
	The total number of times an item is affected by a design change.					

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE	FIELD FORMAT				
		LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	
	DEFINITION					
	DATA ITEM(S)	EXPLANATION				CODE

200 Total Quantity Recommended (Total Qty Rec) 6 N R -

The recommended quantity of the item required to support a specific number of applications for a specific period of time. The applications may be to weapon system, end item, component or combinations thereof which are contained in the applicable contract. The contractor or vendor will base his recommendation on the anticipated failure pattern utilizing defined usage parameters of the item and the known delivery schedule. Unless otherwise advised by the Government, the support period will be for one year beginning with the scheduled delivery of the first end item(s). Support and test equipment, tools, or training material recommendations will be total quantity to support the system/equipment.

201 Training Equipment Requirements Code (TRN EQP) (See Requirements (For))

202 Training Source 250 X L -

A narrative description of the planned or established source of training for the TMDE item.

203 Turnaround (Time) (See Elapsed Time or Man-Hours, also see Repair Cycle Turnaround Time and Contractor Turnaround Time)

204 Type Classification 1 A F -

A designation which records the status of a materiel system in relation to its overall life history as a guide to procurement, authorization, logistical support, asset and readiness reporting.

Contingency	C
Exempt From Type Classification	E
Limited Production	L
Not Separately Type Classified	N
Obsolete	O
Standard	S

205 Type Designator (See Type, Model, Series Designator)

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE	FIELD FORMAT LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	
	DEFINITION					
	DATA ITEM(S)	EXPLANATION				CODE

206 Type, Model, Series, Designator — 26 X F -

A part of nomenclature which provides a method for identifying equipment, usually by broad performance and use characteristics and general configuration. A data chain consisting of all or part of the data elements Type, Model, Series in that order. Instructions for coding the designators assigned in accordance with the publications listed below are contained in CM 51, Appendix II, MIL-STD-482A. A suffix may be added for use with the Joint Electronic Type Designation System.

a. Type Designator — 7 X L -

A broad categorization of equipment based on function or use.

b. Model Designator — 10 X L -

Identifies equipment within a particular Type Designator having essentially the same performance characteristics.

c. Series Designator — 2 X L -

Identifies equipment within a particular Model Designator having the same basic design but not necessarily identical configuration.

d. Suffix Designator — 7 X L -

Supplemental information used with a Type, Model, Series Designator for items using the Joint Electronic Type Designator System.

MIL-STD-155	Joint Photographic Type Designation System
MIL-STD-196	Joint Electronics Type Designation System
MIL-STD-815	Designation System for Liquid, Solid and Liquid-Solid (Hybrid) Propellant Rocket Engines and Motors
AR 700-26	Designating, and Naming Military Aircraft

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE	FIELD FORMAT LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	
	DEFINITION					
	DATA ITEM(S)	EXPLANATION				CODE

206 Type, Model, Series Designator (continued)

AR 70-50	Designating and Naming Defense Equipment, Rockets, and Guided Missiles
ANA Bulletin 306	Engines, Aircraft Turbine, and Jet, Designation of
ANA Bulletin 395	Engines, Aircraft Reciprocating, Designation of

207 Type of Construction 2000 X L -

Describes the type of construction of the facility, including special considerations for shock, hardness, etc.

208 Type of Item Code 3 A F

The field is divided into three sub-fields as follows:

a. Special Materiel Content Code

Antibiotic (medical/drug)	A
Flammable compressed gas	B
Corrosive liquid	C
Alcohol (medical/drugs)	D
Precious metals	E
Flammable liquid	F
Combustible liquid	G
Hazardous substance	H
Oxidizing materiel	J
Medical kits containing any combination of codes A, D, L, and N.	K

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE	FIELD FORMAT: LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	
	DEFINITION					
	DATA ITEM(S)	EXPLANATION				CODE
208	Type of Item Code (continued)					
	Drugs, other than A, D, N, and K requiring special handling/issue/storage					L
	Magnetic materiel					M
	Narcotic					N
	Poison					P
	Extremely flammable liquid					Q
	Radioactive material					R
	Combustible and toxic substance					S
	Toxic substance					T
	Mercury (medical)					U
	Acid (medical)					V
	Nonflammable compressed gas					W
	Radioactive and magnetic material					X
	Non-magnetic					Y
	Flammable solids					Z
	b. Provisioning List Category Code					
	Government furnished					A
	Interim support item					B
	Long lead time items					C
	Tools and test equipment					D
	Bulk item list					E
	Vendor item					F
	Interim released item					G

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE	FIELD FORMAT LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	
	DEFINITION					
	DATA ITEM(S)	EXPLANATION				CODE

208 Type of Item Code (continued)

c. Special Maintenance Category Code

Non-reparable	A
Factory reparable	B
Matched set	C
Select at test	D

209 Unit Cost (See Cost)

210 Unit of Measure Code (UM) 2 A F -

In conjunction with numerical values, completely identifies the quantity of an item desired, measured, weighted, or priced. DOD 4100.39-M and DOD 4130.2M.

211 Unit Price 10 N R 2

The best estimated price for one unit of measure of the line item.

212 Unit Price Marker (UPM) 1 A F -

A code used in conjunction with Unit Price and Unit Cost to indicate that the dollar figure is proposed or estimated.

Proposed	P
Estimated	E
Actual	blank

213 Units 1 A F -

A single letter code which identifies the modifying numerical suffix for a given value.

PICO (10^{-12})	P
MICRO (10^{-6})	U

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE	FIELD FORMAT: LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	
	DEFINITION					
	DATA ITEM(S)	EXPLANATION				CODE

213 Units (continued)

MILLI (10^{-3})	L
CENTI (10^{-2})	C
DECI (10^{-1})	D
UNIT (1)	O
DECA (10)	T
HECTO (10^{2})	H
KILO (10^{3})	K
MEGA (10^{6})	M
GIGA (10^{9})	G

214 Unscheduled Maintenance (Time) (See Elapsed Time or Man-hours)

215 Update Code

Denotes status of a particular punch card or other data handling media.

Addition	Original Card, or card added to data file.	A
Deletion	Card deleted from data file.	D
Change	Change made to update card.	C
Removal	Card removal from data file.	R

216 Usable on Code — 600 | X | L | -

Provides a suitable coding for assemblies and parts to indicate specific usability by serial number, type, model, series, etc. The specific coding to be applied for each contract is constructed in accordance with MIL-M8910 unless specific coding instructions are provided by the procuring activity.

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE / DEFINITION / DATA ITEM(S)	FIELD FORMAT: LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	CODE
217	Utilities Requirements Provides an estimate of the total connected load, or other gross quantity of utilities required for each facility. Includes any unusual or critical requirements. Provides specific identification of the class of utility; e.g., electric power, hydraulic power, compressed air, water, and sewage.	2000	X	L	-	
218	Voltage Range (See Range)					
219	Volume (See Length)					
220	Watts The unit of power equivalent to the current of one ampere flowing across a potential difference of one volt.	4	N	R	-	
221	Weight The weight of the item in ounces, pounds, tons, long tons, etc., as established by the data element Unit of Measure Code.	6	N	R	1	
222	Width The width of the item in millimeters, feet, etc., as established by the data element Unit of Measure Code.	4	N	R	2	
223	Work Area Code Assigned to the area of work (e.g., wheelwell). If a given maintenance function is to be performed on an end item piece of equipment or at a specific location, enter the code used to sectionalize work areas for inspection requirement manual sequence charts. Since the assignment of work area codes must be consistent for the total system, the assignment of final codes must be coordinated among contractors or assigned by the integrating contractor.	4	X	R	-	
224	Work Breakdown Structure (WBS) An identification system which relates hardware, software, services, and other work tasks to their position or location in a system/equipment and thus completely defines the project or program. See MIL-STD-881 for definitions of WBS elements.	11	X	L	-	

Appendix B--Continued

DED NO.	STANDARD DATA ELEMENT TITLE	FIELD FORMAT LENGTH	TYPE	JUST	DECIMAL PLACE-RIGHT	
	DEFINITION					
	DATA ITEM(S)	EXPLANATION				CODE

225 Work Unit Code (WUC) 7 X L -

The WUC is a five- or seven-character code that identifies the system, subsystem, component, or part of the end item being worked on. It is assigned to every reparable item and to nonreparable mission essential or time change items. Five digit codes are assigned to items normally removed, replaced, tested, adjusted or repaired by maintenance personnel while performing "on equipment" work; i.e., work at or on the end item which does not require the use of shop equipment other than portable test or repair equipment. Seven digit codes are assigned to reparable components, subassemblies, modules, cards, and significant parts in order to facilitate the reporting of "in shop" component repair work.

226 Year of Fielding 2 N F -

The calender year that the supported end item or system is to be fielded.

Appendix C

ANALYSIS GUIDELINES FOR DETERMINATION OF THE MAINTENANCE PLAN USING THE PRINCIPLES OF RELIABILITY CENTERED MAINTENANCE

C-1. Purpose. This appendix provides analysis guidelines for deriving the detailed maintenance plan for systems/equipment undergoing logistic support analysis (LSA). Included in these guidelines is a description of, and instructions for the application of reliability centered maintenance (RCM) on systems and their components to arrive at maintenance planning information. This appendix also provides examples of RCM application on selected components.

C-2. Concept. a. The maintenance plan for a system/equipment is a description of the requirements and tasks to be accomplished for achieving, restoring, or maintaining the operational capability of the system/equipment. The maintenance plan evolves from the succeeding iterations of the LSA to identify the maintenance concept, reliability and maintainability parameters and requirements, maintenance tasks, descriptions of maintenance organizations, support and test equipment requirements, maintenance standards, supply support requirements, and facility requirements.

b. Maintenance plan determination must recognize the interrelationships between the LSA tasks contained in MIL-STD-1388-1 and other system engineering disciplines such as the reliability, maintainability, safety, standardization, and human engineering programs. Efficient maintenance planning requires input from and output to these related disciplines.

c. This appendix will concentrate on that portion of maintenance planning which requires determination of maintenance requirements in the form of scheduled and unscheduled maintenance tasks. This step in the overall determination of the detailed maintenance plan provides the basis for the scheduled maintenance workload for the system/equipment, and impacts the ability to sustain the inherent reliability of the system and its components and maintain adequate safety levels for the operator/crew in an operational environment.

d. Inherent to the maintenance planning process, as with other LSA tasks, is the identification of logistic support problems and risks, and development of the required data to support trade-off analyses with design personnel. The guidelines presented in this

appendix are structured to identify areas for design review and trade-offs in addition to the segregation of maintenance task requirements into scheduled and unscheduled categories.

C-3. Background. a. The procedures presented in this appendix to develop scheduled maintenance programs represent an evolution from the procedures developed in July 1968, by representatives of various airlines which constituted the Maintenance Steering Group (MSG). This group developed decision logic and intra-airline/aircraft manufacturer procedures for developing scheduled maintenance programs for the Boeing-747 aircraft. Subsequently, these procedures were refined and Boeing-747 peculiarities were deleted to make a more universal document titled "Airline Manufacturer's Maintenance Program Planning Document - MSG-2."

b. The potential value of the MSG-2 concept to the Department of Defense was acknowledged by the Secretary of Defense in his annual Defense Department report for FY-76, citing the success of the Navy application of MSG-2 on their P-3 aircraft program. DOD direction was subsequently provided to the services to apply the MSG-2 concept to new aircraft entering service in FY-77, to in-service aircraft by the end of FY-79, and to all other military equipment by the end of FY-79. The Department of Army (DA) implementation of the MSG-2 concept is called reliability centered maintenance (RCM). This appendix provides guidelines for application of RCM on developmental systems as part of the LSA process.

C-4. Maintenance Program Objectives. a. An efficient maintenance program is designed to meet the following objectives:

(1) Preservation of the inherent design levels of reliability and safety.

(2) Accomplishment of this preservation at the minimum practical costs.

b. To meet these objectives, the following principles must be recognized:

(1) Only engineering design changes can correct deficiencies in the inherent levels of safety and reliability.

(2) The maintenance program can only prevent deterioration of the inherent levels achieved through design.

C-5. RCM Role in Maintenance Planning. a. Maintenance plan development is initiated during the conceptual phase of program development as part of the logistic support analyses to identify alternative support concepts; reliability, availability, maintainability, and initial life cycle support cost goals; and potential logistic problems. From this broad base, the detailed maintenance requirements and tasks are identified and tested during the validation and full-scale development phases of the life cycle as the baseline logistic support concept is established and hardware design progresses. The finalized plan is reflected by the maintenance allocation chart (MAC) contained in the organizational level maintenance manual for the system/equipment.

b. An important step in the evolution of the maintenance plan is the segregation of the maintenance requirements into the following categories:

(1) On-condition category. On-condition maintenance requirements are scheduled inspections or tests designed to measure deterioration of an item. Based on the deterioration of the item, either corrective maintenance is performed or the item remains in service.

(2) Hardtime category. Hardtime maintenance requirements are scheduled removal tasks at predetermined fixed intervals of age or usage.

(3) Condition monitoring category. Condition monitoring maintenance requirements are unscheduled tasks. Condition monitored components are those which are allowed to fail or are components where impending failure can be detected by the operator/crew through routine monitoring during normal operations.

c. The segregation of maintenance into these three categories will determine the scheduled maintenance burden on the field, impact the operating and support (O&S) cost incurred by the system, and impact the operational readiness characteristics of the system/equipment. The driving force in the development of the maintenance plan is to reduce the scheduled maintenance burden and O&S cost incurred by the system while maintaining the necessary readiness rate.

d. RCM provides the detailed logic process to segregate maintenance requirements into the on-condition, hard time, and condition monitoring categories. As an integral part of the LSA process, application of RCM requires input from other system engineering programs such as reliability, maintainability, and safety, and it provides data to other logistic analyses such as level of repair analysis, detailed maintenance task analysis, and trade-off analyses with the design engineering function. The overall relationship of RCM in the LSA process is graphically depicted in figure C-1.

Appendix C--Continued

LSA PROCESS

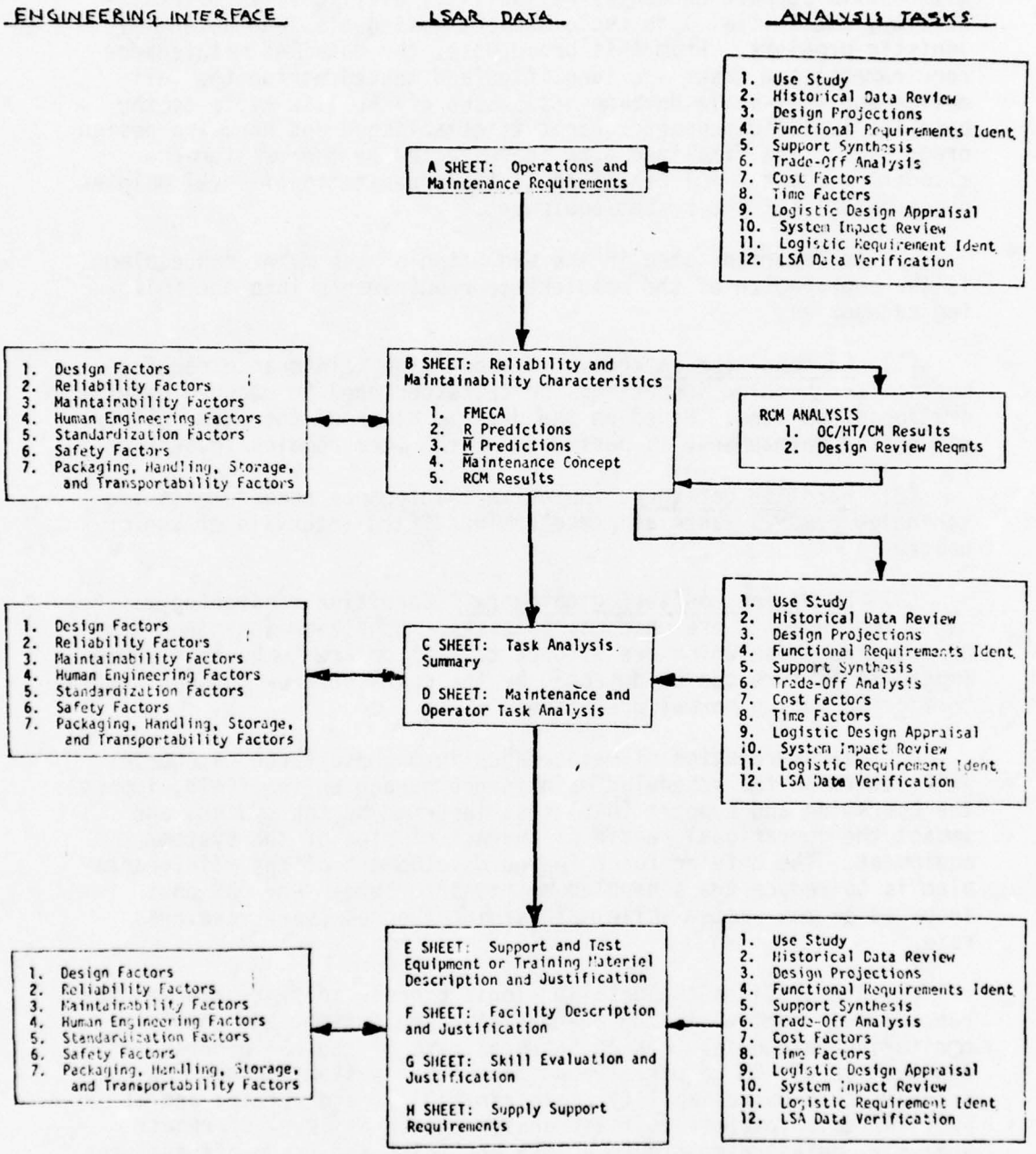


Figure C-1: RCM in the LSA Process

C-6. RCM Logic - General. a. The RCM logic presented in this appendix (figure C-2) is designed to accomplish the following:

(1) Using data from the system safety and reliability programs, identify components in the system/equipment which are critical in terms of mission and/or operating safety.

(2) Provide a logical analysis process to determine the feasibility and desirability of scheduled maintenance task requirements.

(3) Highlight maintenance problem areas for design review consideration.

(4) Provide the supporting justification for scheduled maintenance task requirements.

b. The logic process is based upon the following criteria:

(1) Scheduled maintenance tasks should be performed on non-critical components only when performance of the scheduled task will reduce the life cycle cost of ownership of the system/equipment.

(2) Scheduled maintenance tasks should be performed on critical components only when such tasks will prevent a decrease in reliability and/or deterioration of safety to unacceptable levels, or when the tasks will reduce the life cycle cost of ownership of the system/equipment.

c. The RCM logic presented in figure C-2 is intended for application once a component's failure modes, effects, and criticality have been identified. As with other LSA tasks, the logic process will be reapplied as available data moves from a predicted state to measured values with a higher degree of certainty and as design changes are made. In addition, once all components have been subjected to the logic process, an overall system analysis is required to arrive at the overall maintenance plan. This system analysis merges individual component requirements into a system maintenance plan by optimizing the frequency of scheduled maintenance requirements and the sequence of performance of individual scheduled tasks.

d. The RCM logic will be applied to each reparable item in the system/equipment. The maintenance task requirements will be identified against the reparable components; however, individual failure modes must be addressed during the application of the RCM logic presented in figure C-2. Thus for a given component, different

scheduled tasks could be arrived at due to the different failure modes and their characteristics. As an example, a given component might undergo condition monitoring by the operator/crew during normal operations to detect the majority of predicted failure modes for the component, while still having an on-condition or hard time requirement due to a failure mode that is not detectable during routine operator/crew monitoring.

e. In addition to the scheduled maintenance task requirements identified during application of the RCM logic in figure C-2, any scheduled tasks that were assumed in establishing the reliability characteristics of the system/equipment under the reliability program must either be included in the maintenance plan or identified to the reliability community as being omitted from the maintenance plan. Inherent failure rates and failure modes and effects might need adjusting if an assumed scheduled maintenance action is omitted from the maintenance plan after application of the RCM logic. For example, the reliability data provided for an internal combustion engine and its internal components might be based on 6000 mile scheduled oil and oil filter changes. If this schedule is changed in developing the detailed maintenance plan for the engine, the resulting effect on the reliability parameters must be determined.

f. When determining if a failure is critical for mission considerations, the mission of an individual piece of equipment will be the governing factor. Thus, for a missile component, the individual missile is addressed, not the complete missile system composed of many launchers and missiles.

C-7. Detailed Instructions for RCM Logic Application (Blocks 1-12 Figure C-2). a. Figure C-2 displays the RCM logic to be used to determine if a component should have a scheduled maintenance requirement. Each decision block is numbered and detailed instructions for each block are provided below. The results of the logic process will be recorded on Data Sheet B in accordance with the instructions in paragraph C-10.

b. The following is a detailed set of instructions for application in the logic in figure C-2.

(1) Block 1. These questions will be asked for each failure mode identified on Data Sheet B for the component under analysis. The answer to these questions will be based on the failure effects and criticality documented as part of the FMECA. A "yes" answer indicates that a failure mode exists which will result in either a safety hazard or a mission abort due to a critical loss of mission capability (mobility, weapons, communications, survivability). Components and modes for which a "yes" answer is obtained will be referred to as critical. These critical items will be analyzed further to determine if a scheduled task will help prevent deterioration of reliability or safety levels thus minimizing the risk of a mission abort or safety hazard. A "no" answer indicates the component is non-critical in terms of mission and/or safety and scheduled maintenance would only be justified on an economic basis or if it causes secondary failures which are critical.

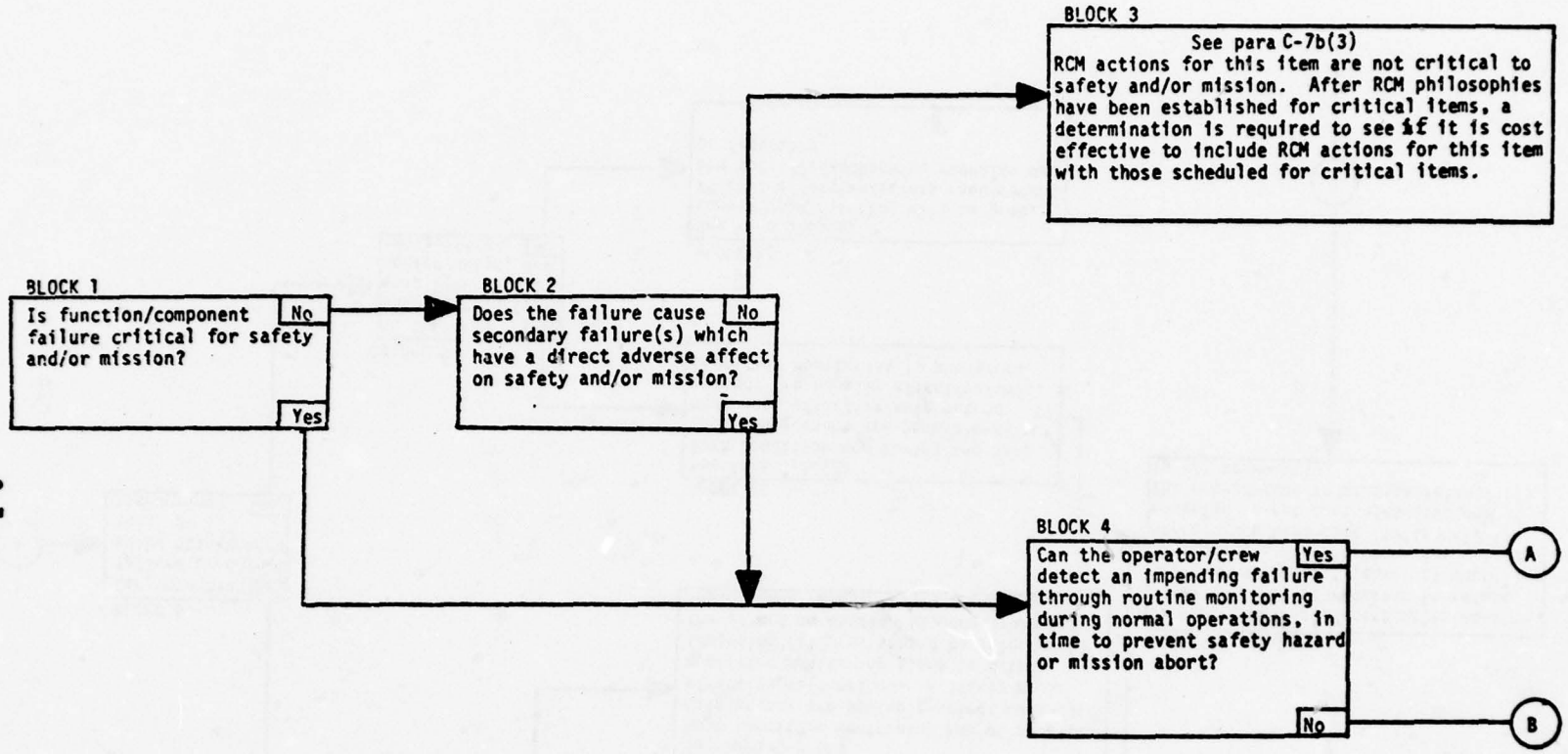


Figure C-2: RCM Logic

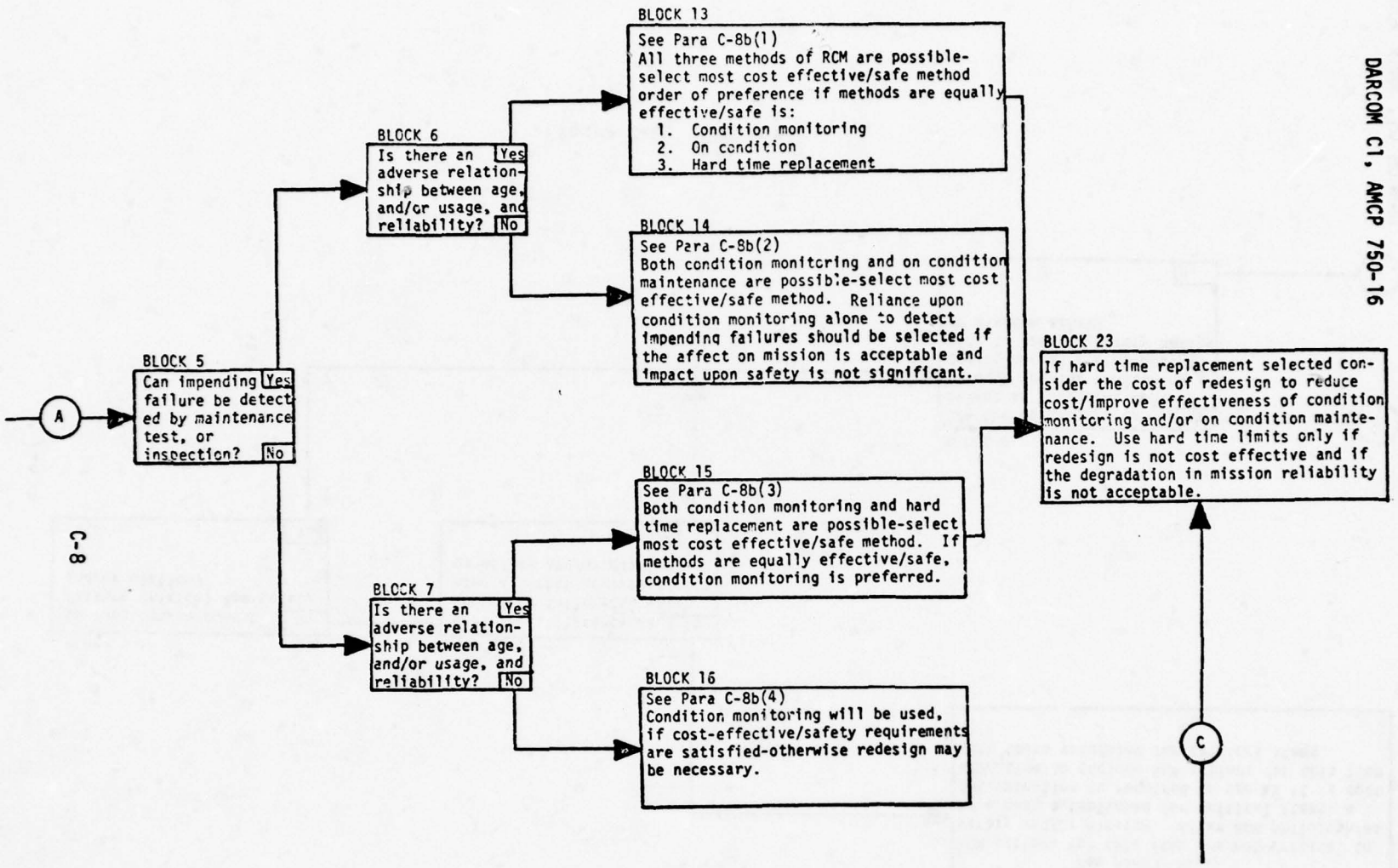


Figure C-2: RCM Logic

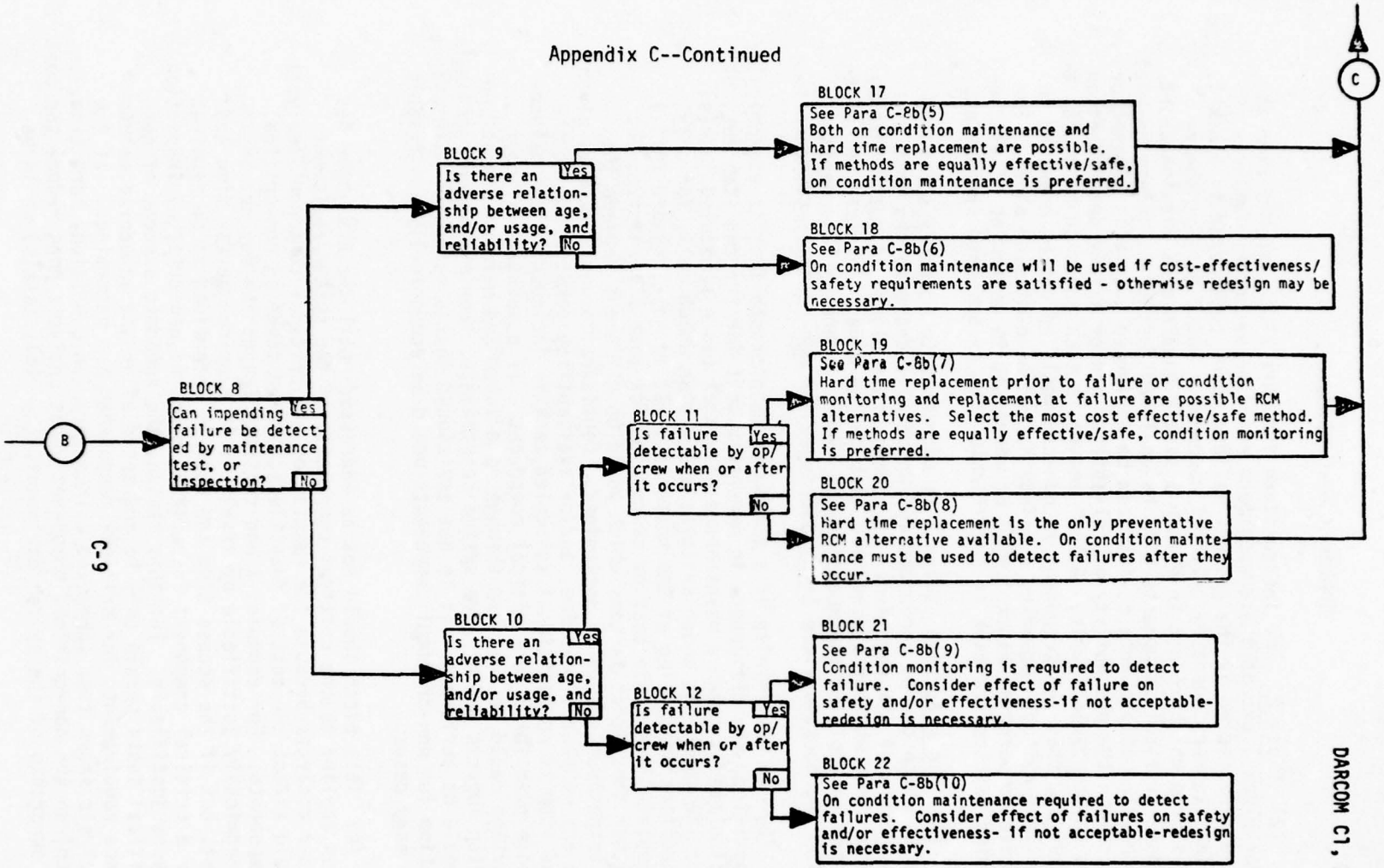


Figure C-2: RCM Logic

(2) Block 2. The instructions for this block are the same as for block 1 except these questions refer to secondary failures that are caused by the primary failure modes considered in block 1. "Yes" answers identify critical components which have secondary failures which result in either a safety hazard or a mission abort. These critical components will be analyzed further to determine what scheduled maintenance actions can be performed that will prevent or decrease the probability of reliability and/or safety deterioration to unacceptable levels. A "no" answer to each question in Blocks 1-2 indicate that the component is non-critical and can be operated to failure without incurring a safety hazard or a mission abort. For these components, Block 3 will be addressed to determine if a scheduled maintenance task is justifiable from an economic standpoint.

(3) Block 3. (a) Block 3 is addressed to identify scheduled tasks which can be performed and which will decrease the cost of ownership of the end item. To address this block, it must first be determined whether a scheduled task can be done. This can be determined by applying the questions in blocks 4 through 12, keeping in mind the questions are being addressed for non-critical components.

(b) In determining if a scheduled maintenance task is economically justified, the difference in ownership cost for the end item must be calculated between a maintenance plan that has a scheduled task(s) for the component under analysis and a plan which calls for only condition monitoring of the component. It is not intended that a complete life cycle cost be calculated for each alternative, but rather those cost factors which would be different between the alternatives should be determined. Consideration must also be given to any manpower, downtime, and/or availability constraints on the end item if an additional scheduled task is included in the maintenance plan for a non-critical component. If a substantial cost savings could be realized through some scheduled maintenance action which impacts one or more system constraints, then a trade-off analysis should be performed. It is not envisioned that a scheduled maintenance action for non-critical components would be economically justifiable in many cases.

(c) This block should not be addressed until the RCM logic has been applied to the critical components of the system/equipment under analysis because the results of the critical component analysis could affect the cost of feasible scheduled tasks on non-critical components. For example, a non-critical inspection may not be economically justifiable by itself if it requires access time and cost, but if the access time and cost is determined to be required for a critical component inspection, then the non-critical inspection may be justifiable. For this reason, the economic aspects of non-critical tasks should only be addressed after the scheduled maintenance requirements for critical components are determined. If the analysis shows that scheduled maintenance (on-condition, hard time, or both) on the non-critical component under analysis does reduce the cost of ownership of the system/equipment, then this task(s) would be

included in the overall maintenance plan and documented on Data Sheets C and D of the LSAR. If a scheduled task is not feasible or is not economically justified for the non-critical component under analysis, then that component would be operated to failure and only unscheduled maintenance would be performed on it.

(d) For task interval and cost considerations of scheduled tasks being analyzed during this analysis, see paragraph C-9 of this appendix. Paragraph C-9 presents some general considerations that must be addressed when performing the RCM analysis.

(4) Block 4. The question in block 4 is intended to identify those critical failure modes which can be detected through routine operator crew monitoring with sufficient leadtime to prevent a mission abort and/or safety hazard. If there is a high probability that the failure mode under analysis can be detected with sufficient leadtime before it will actually occur to prevent a mission abort or incurrence of a safety hazard, then the question will be answered "yes". This will be the case for failure modes which have a sufficient time difference between onset of initial degradation and actual failure and a means of detecting the onset. The detection means can be in the form of instrumentation (gauges, warning lights, etc.) or operational characteristics (vibration, sound, etc.). The question will be answered "no" if the operator/crew cannot detect an impending failure, or if the time difference between onset and actual failure is not long enough to prevent a mission abort or safety hazard.

(5) Block 5.

(a) The question in this block is addressed to identify the potential efficiency of a scheduled maintenance task on the component under analysis. The question must be considered in two parts. First, the impending failure must be physically detectable either by visual inspection or through use of test or measurement equipment. To be detectable, measurable physical properties of the component must change with the onset of degradation to allow identification of impending failure through comparison with normal properties.

(b) The second consideration is the probability that the scheduled inspection or test will coincide with the time between failure onset and occurrence so that the impending failure will be caught. As an example, a component which fails within seconds after the onset of any measurable degradation would not be a good candidate for a scheduled task. The probability that any reasonable inspection interval would result in the inspection occurring within the time between onset and failure is very small in this case; consequently, the payoff would be extremely small. On the other hand, if the time between measurable failure onset and actual failure occurrence was measured in days or months, then an inspection interval could be established which would result in a high probability of detecting the failure under analysis before it occurs. In answering this consideration, the failure distributions from the Reliability Program, data from a historical data review, and applicable test results must be analyzed.

(c) If the impending failure is physically measurable and a reasonable task interval can be established which results in an acceptable probability of detection, then the question in block 5 would be answered "yes." If one or both of these considerations is not met, then block 5 would be answered "no."

(6) Block 6.

(a) The question in this block is addressed to identify wearout type components and to determine the feasibility of scheduling a hardtime type replacement of the component under analysis. This question would be answered "yes" if the probability of component failure increases as calendar time or usage indicators (operating hours, miles, rounds, cycles) increase. For these items, a scheduled removal could be identified at a point in time or after a specified amount of usage when the probability of failure increases to an unacceptable level. Removal and replacement with a new item will decrease the probability of failure back to its original level. This question will be answered "no" if the probability of failure is independent of both calendar time and usage. This is the case for components which exhibit an exponential failure rate.

(b) In answering the question in this block as "yes" it should be noted that a means of measuring the interval between scheduled replacements must be provided for the component. If the usage on the component cannot be economically maintained, then the question in this block must be answered "no" because a hardtime replacement would not be feasible.

(7) Block 7. The same instructions that were provided for block 6 apply to block 7. See paragraph C-7b(6).

(8) Block 8. The same instructions that were provided for block 5 apply to block 8. See paragraph C-7b(5).

(9) Block 9. The same instructions that were provided for block 7 apply to block 9. See paragraph C-7b(6).

(10) Block 10. The same instructions that were provided for block 7 apply to block 10. See paragraph C-7b(6).

(11) Block 11. The question in block 11 is addressed to identify hidden functions where incurrence of the failure mode under analysis may go undetected until the function is required. If the operator/crew cannot detect that a failure has occurred, then on-condition type tests or inspections may be required to insure that a failure has not occurred and that there is a high probability that the hidden function will be available when required.

(12) Block 12. The same instructions that were provided for block 11 apply to block 12. See paragraph C-7b(11).

C-8. Determination of Scheduled Task Requirements (Blocks 13-23, Figure C-2). a. This paragraph will provide general guidelines for using the results of the RCM logic process. Upon completion of the applicable questions in blocks 1 through 12 of figure C-2, the analyst must determine which of the feasible alternatives results in the best maintenance plan. The final blocks reached as a result of the RCM application will be described below to serve as an aid in determining the maintenance plan for the component under analysis.

b. Provided below are block by block descriptions for analyzing the results from application of the RCM logic contained in figure C-2.

(1) Block 13.

(a) This block identifies critical components that exhibit wearout characteristics and impending failures can be detected by both routine operator/crew monitoring and maintenance test or inspection. For components in this class, condition monitoring will always be performed and on-condition and/or hard time tasks will only be included if condition monitoring does not maintain the required mission and/or safety levels. If this is the case, then on-condition and/or hard time maintenance would be considered if their inclusion in the maintenance plan would satisfy the mission/safety requirements.

(b) For most components that fall into this category after application of the RCM logic, routine operator/crew monitoring during normal operations would provide an acceptable level of reliability and safety at the least cost. To analyze each alternative, the considerations provided in paragraph C-9 of this appendix should be addressed.

(2) Block 14. This block identifies critical components where impending failures can be detected by the operator/crew through routine monitoring and by maintenance test or inspection. For components in this class, the condition monitoring by the operator/crew would be selected and the on-condition task would not be required as long as both offer the same probability of detection. If the analysis shows that the on-condition test or inspection provides a more reliable detection probability, then it should be considered for inclusion in the maintenance plan along with the condition monitoring requirement. See paragraphs C-9b(2) and C-9b(3) for economic considerations of each alternative under analysis.

(3) Block 15. This block identifies critical components that exhibit wearout characteristics and the operator/crew can detect

impending failures through routine monitoring. For components in this class, condition monitoring would be done by the operator/crew and an analysis would have to be performed to justify a hardtime task against the component. A hardtime task would not be justifiable for components that can be condition monitored unless a hardtime replacement limit can be established with a high degree of confidence and supported with real and applicable data, and the analysis shows the hardtime replacement would sustain a higher level of reliability and/or safety. See paragraphs C-9b(1) and C-9b(3) for economic and interval considerations for each alternative.

(4) Block 16. This block identifies critical components where impending failures can be detected by the operator/crew through routine monitoring, but on-condition and hardtime maintenance tasks would not provide any benefit. For these components, condition monitoring would be the only maintenance requirement other than the unscheduled repair or replacement tasks after an impending failure is detected. If the condition monitoring does not sustain the required safety levels and mission effectiveness, then feasible redesigns must be addressed to satisfy the requirements. See paragraph C-9b(3) for the cost considerations that must be addressed to determine the effectiveness of the condition monitoring.

(5) Block 17.

(a) This block identifies critical components that exhibit wearout characteristics and impending failures can be detected through maintenance tests or inspections. For components that fall into this category, the inherent reliability and safety levels can be preserved by either a hardtime replacement, or an on-condition test or inspection. Each of the two alternatives must be analyzed in terms of cost and the reliability and safety levels that can be maintained under each alternative.

(b) For those cases where the frequency of the on-condition type task is high, a hardtime replacement may be more cost effective if the hardtime limit can be established with a high degree of confidence and it provides the necessary reliability and safety protection levels. In other cases where the component is costly and/or there is not enough data to establish a hardtime replacement limit with any degree of confidence, then the on-condition type task may be more cost effective. In each case, the benefits and risks of each alternative maintenance policy should be analyzed to select the most effective. If both are equally effective/safe, then the on-condition task is preferred over the hard time task. See paragraphs C-9b(1) and C-9b(2) for the safety and effectiveness considerations that must be addressed for each alternative.

(6) Block 18.

(a) This block identifies critical components where the only feasible means of sustaining the inherent reliability and safety levels is through an

on-condition type maintenance test or inspection. For these components the frequency of the scheduled inspection or test must be established along with the critical values/characteristics of the component which separate a good component from one which has experienced an onset of failure. These critical characteristics should be clearly stated and easily measurable wherever possible to prevent uncertainty on the part of inspector or tester after performing the required task. If the reliability and safety levels without an on-condition task are acceptable, then no on-condition maintenance is required.

(b) Component redesign should be considered when the on-condition task does not maintain the required safety levels or mission effectiveness. See paragraph C-9b(2) for the safety and mission considerations of on-condition maintenance.

(7) Block 9.

(a) This block identifies critical components that exhibit wearout characteristics, but impending failures cannot be detected either through routine operator/crew monitoring or by maintenance tests or inspections. Actual failures are detectable by the operator/crew either at the time of occurrence or after occurrence so that unscheduled repair or replacement can be accomplished in the event of failure. For these components, the only feasible scheduled task that will prevent or decrease the probability of reliability and/or safety deterioration to unacceptable levels would be a scheduled removal at specified intervals of time or usage. If the reliability and safety levels are adequate without the hard time task, then it should not be included in the maintenance plan.

(b) Prior to making a final determination for components in this category, an analysis should be made concerning the feasibility of redesign to provide a means of maintenance testing or inspection for impending failures. The ability to test for specified wear or degradation limits might reduce the number of component replacements and consequently provide a life cycle cost savings when analyzed with the cost of redesign to provide the detection capability. This alternative should especially be considered for high value components where hard time replacements are the only means of sustaining the required reliability and safety levels.

(c) See paragraph C-9b(1) and C-9b(3) for mission and safety considerations to be addressed when analyzing the feasible alternatives for components that fall into this class.

(8) Block 20.

(a) This block identifies critical components that exhibit wearout characteristics, but impending failures cannot be detected either through routine operator/crew monitoring or by maintenance tests or inspections. In addition, actual failures will go undetected by the operator/crew due to the hidden function nature of the component. For components that fall into this class, an on-condition type maintenance test or inspection must be included in the maintenance plan to detect failures that have occurred and insure that there is a high probability of the hidden function being available when required.

(b) In addition to the on-condition task to detect failures that have occurred, a scheduled hard time replacement should be established based on the wearout characteristics of the component to prevent or decrease the probability of reliability and/or safety deterioration to unacceptable levels. Establishment of the hard time task should be dependent upon an analysis to determine the feasibility and cost effectiveness of redesigning the component under analysis as described under block 19, paragraph C-8b(7)(b). See paragraphs C-9b(1) and C-9b(2) for mission and safety considerations that must be addressed for components that fall into this class. If reliability and safety levels are adequate without the tasks, then they should not be included in the maintenance plan.

(9) Block 21.

(a) This block identifies components which have critical failure modes with no means of detecting impending failures or reducing the probability of a mission abort or safety hazard. Actual failures are detectable by the operator/crew either at the time of occurrence or after occurrence so that unscheduled repair or replacement can be accomplished in the event of failure. For components in this category there are two alternatives. One alternative is to redesign the component and/or interfacing components to eliminate the critical failure modes or to provide a means of detecting the impending failure. In the second case, no scheduled maintenance would be performed and the risks of incurring a mission abort or safety hazard would have to be acceptable.

(b) To determine which alternative will be taken, the feasibility and costs of the redesign must be determined along with the potential benefits from the redesign. In some cases, the required redesign may involve the addition of a test point or measurement device, while in other cases the cost of redesign may be prohibitive of incorporation or the redesign may not be technically feasible. The intent of the RCM logic in this case is to highlight the problem so that the possible solutions may be addressed. See paragraph C-9b(3) for the mission and safety considerations that must be addressed for the condition monitoring requirements to detect failures that have occurred.

(10) Block 22.

(a) This block identifies components which have critical failure modes with no means of detecting impending failures, no wearout characteristics, and no means for the operator/crew to detect failures that have occurred. For components that fall into this category, an on-condition type task must be included in the maintenance plan to detect failures that have occured and insure that there is a high probability of the hidden function being available when required. See paragraph C-9b(2)(d) for the mission and safety considerations that must be addressed for the on-condition requirements to detect failures that have occurred.

(b) There are two alternative courses of action that can be taken because of the nondetectability of impending failures. The first is to redesign the component and/or interfacing components to eliminate the critical failure modes or provide a means of detecting impending failures. The second alternative is to accept the inherent probability of failure and risk of incurring a mission abort and/or safety hazard.

(c) To determine which alternative should be taken, the feasibility and costs of a redesign must be determined along with the potential benefits from the redesign. In some cases the required redesign may involve the addition of a test point or measurement device, while in other cases the cost of redesign may be prohibitive of incorporation or a redesign may not be technically feasible.

(11) Block 23. This block is included in the RCM logic to highlight those areas where redesign should be actively pursued as an alternative to hard time replacements. Hard time replacements should be included only if required mission and safety levels cannot be achieved through condition monitoring and/or on-condition maintenance and a redesign to achieve the required levels is not feasible or is not cost effective.

C-9. General Methodology for Determination of Maintenance Intervals.

a. Once the RCM logic has been applied and a decision has been reached on the type of maintenance to be performed, then safety and cost considerations must be addressed to establish the maintenance intervals. On-condition and hard time intervals should coincide whenever possible to reduce the impact on the user. This section presents the considerations that must be addressed when establishing intervals for on-condition and hard time, and analyzing the cost of condition monitoring.

b. Following are the general considerations to be addressed for each of the three maintenance categories:

(1) Hard time limits.

(a) Hard time limits are established for items where condition monitoring and/or on-condition maintenance is not feasible from a safety and/or cost effectiveness standpoint (e.g., does not provide adequate assurance of detection prior to failure).

(b) Hard time limits are established as a prerequisite for assuring safety or cost effectiveness. The general techniques to be followed in establishing hard time replacement intervals are as follows:

1. Safety consideration.

a. MIL-STD-882, System Safety Program for Systems and Associated Subsystems and Equipment: Requirements for, prescribes requirements governing safety.

b. The safety hard time limit is usually established by first establishing the cumulative failure distribution for the item (this distribution can usually be obtained from emperical test data or from reliability predictions), and then establishing a replacement interval which results in an extremely low probability of failure prior to replacement. Figure C-3 shows an example of how a hard time limit can be established for safety considerations. The cumulative failure distribution was established for the component and then the resulting limit was determined which would provide an 85 percent probability that the component would not fail prior to replacement.

c. The hard time limit for the component falls within the anticipated service life of the system. If the limit exceeds the service life, preventive replacement is not required.

2. Cost and effectiveness consideration.

a. Where the failure does not cause a safety hazard but rather causes mission failure, the readiness hard time interval is established in a trade-off process involving the cost of replacing components, the cost of a failure, and the readiness requirement of the equipment/system.

b. The process of establishing the replacement interval (Tr) is accomplished through minimization of the following cost equation.

$$C(Tr) = \left[Cpr + C_f(F(Tr))\right] / T_r$$

where

C(Tr) = Expected cost per unit time.

Cpr = Cost of a preventative replacement.

Cf = Cost of a failure. If $C_f = C_{pr}$ then cost is not a determining factor. The value of Tr should be established based on mission requirements.

F(Tr) = Expected number of failures in interval Tr.

Tr = Replacement interval.

c. Depending upon the equation defining the failure distribution, this equation can be solved by differentiation or by iteration (substituting different values for Tr and calculating the resultant expected cost).

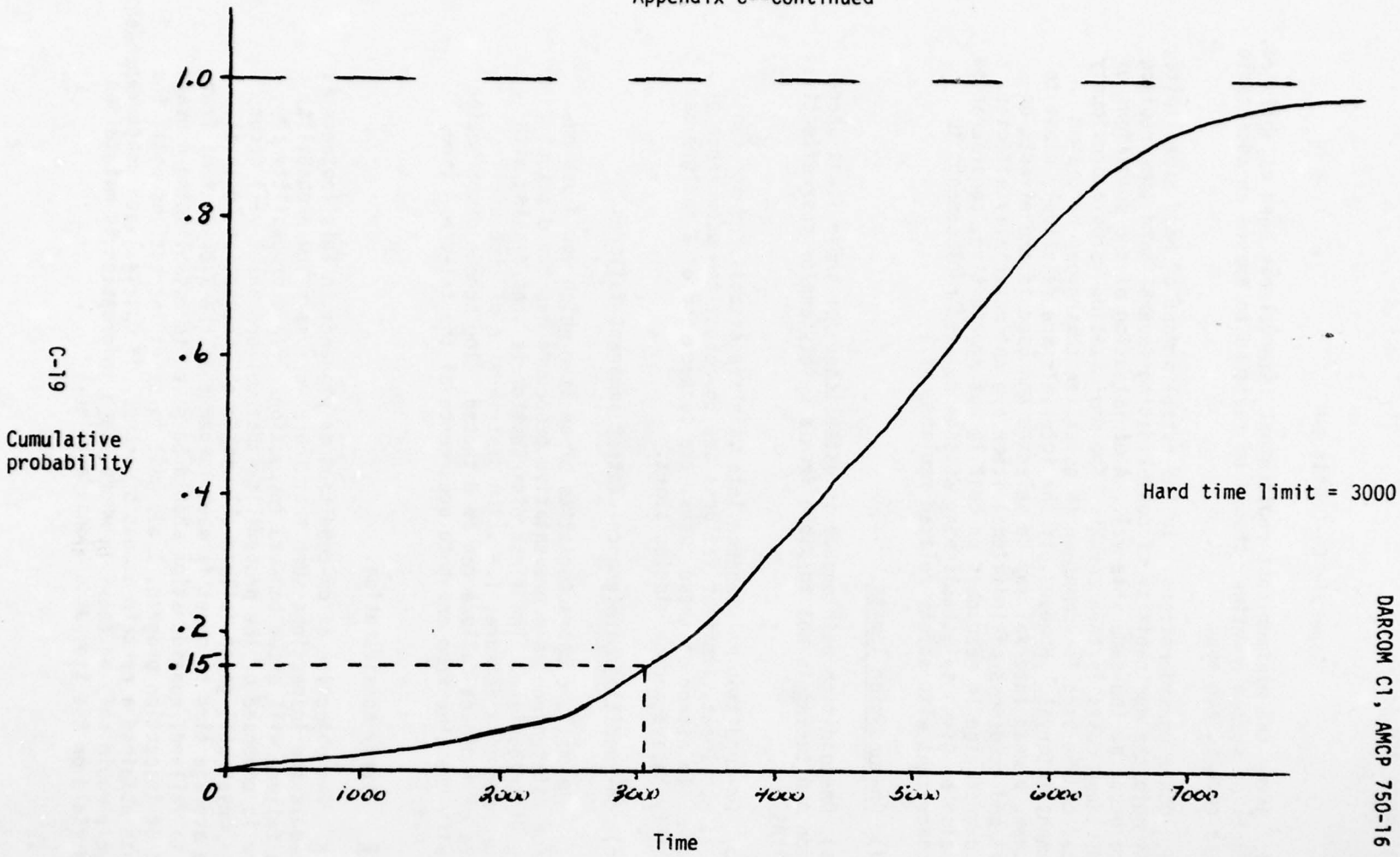


Figure C-3: Cumulative Failure Distribution

d. After the minimum-cost replacement interval has been established, the effects on system downtime should be reviewed to assure an acceptable readiness rate is achieved.

3. Other considerations. In the establishment of hard time limits, one must note the desirability of consolidating several hard time replacements to occur at the same interval. A minimization of the summations of the individual costs is then sought. The minimization formula previously presented can be used in summation to establish this group hard time replacement interval. However, if the intervals are relatively close to each other, a mean interval may be selected and used if the effects on the cost and readiness of individual items are not materially affected. (Where degradation in readiness or cost is not prohibitive, consideration should also be given to establishing mission related replacements to occur concurrent with safety related replacement.)

(2) On-condition limits.

(a) On-condition maintenance is established for those items where condition monitoring is not feasible from a safety and/or cost-effective standpoint.

(b) On-condition maintenance intervals are established for two purposes: to locate imminent failures and to detect the occurrence of a failure. In either of these cases, the consequence of a failure may be a safety hazard and/or mission abort.

(c) On-condition maintenance--detect imminent failures.

1. The failure characteristics of an item which would use on-condition maintenance as a preventative procedure has two distinct failure distributions. The first distribution is that dealing with time to onset of a failure; i.e., the distribution of time until evidence of imminent failure can be detected. The second distribution deals with the time from onset to occurrence of the failure. (See figure C-4.)

2. Safety consideration.

a. The objective of on-condition maintenance in this instance is to schedule the inspections such that there is a very low probability that a failure will occur between inspections. This probability of failure is composed of the probability that failure onset will occur, and the onset will go to failure all within the inspection interval. If the average time to onset is much larger than the average time from onset to failure, consideration should be given to establishing a usage dependent inspection program, i.e., wait to start inspections until the item has obtained a certain amount of usage. Of course, such usage dependent intervals would only be feasible where usage information is maintained by the field on the item under consideration.

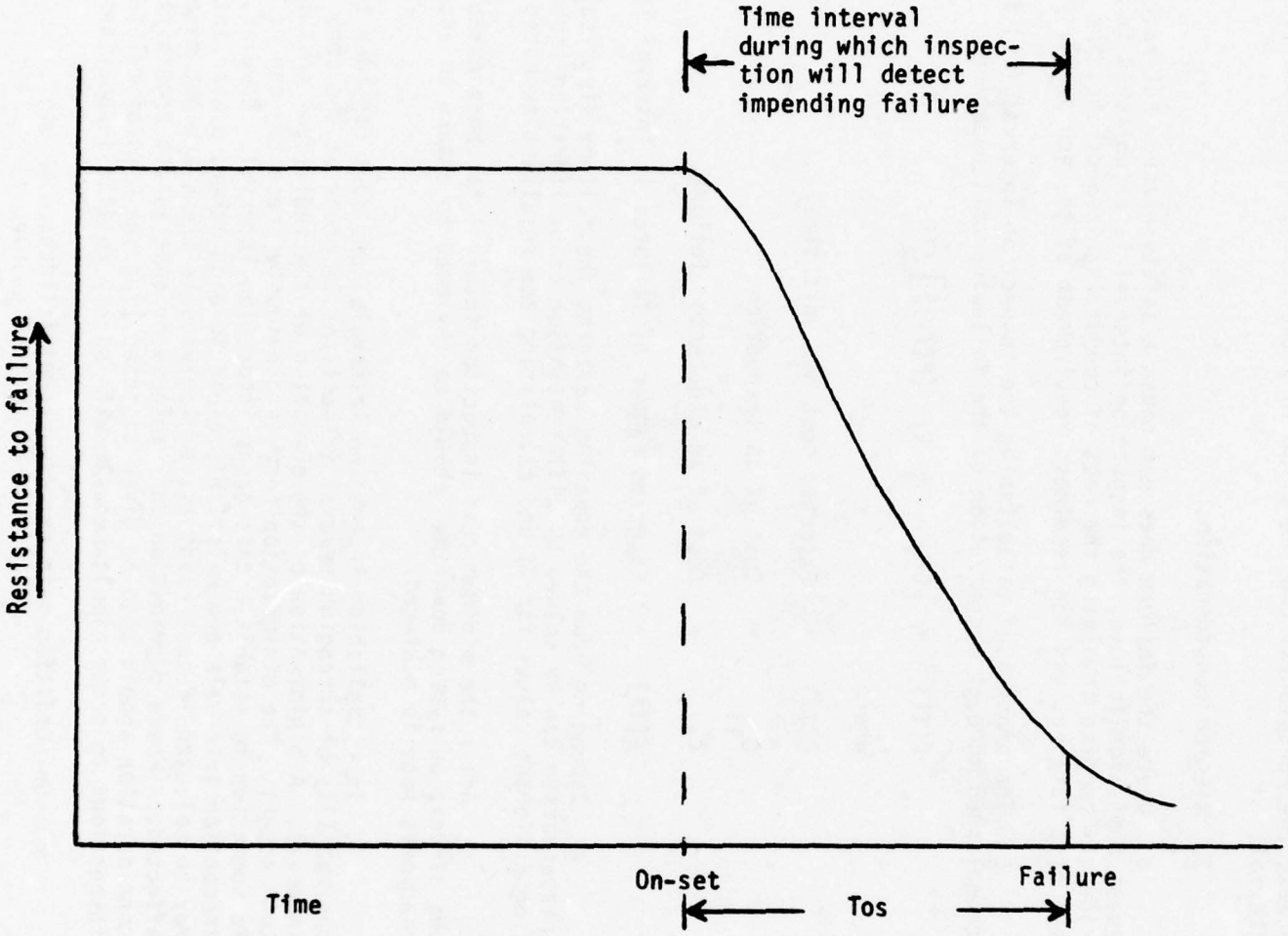


Figure C-4: Example of Tos

b. If usage information is not routinely maintained by the field on the item, then the distribution of time from onset to failure becomes the fundamental consideration in establishing the inspection interval.

3. Mission consideration.

a. Where the failure does not cause a safety hazard, but rather causes a mission failure, the inspection interval is established in a trade-off process involving the cost of conducting inspections, the cost of a failure, and the readiness requirement of the equipment/system.

b. The process of establishing the inspection interval (Ti) is accomplished through minimization of the following cost equation:

$$C(Ti) = \left[C_{Ti} + C_f \ (F(Ti))\right] / Ti$$

where

$C(Ti)$ = Expected cost per unit time.

C_{Ti} = Cost of an inspection.

C_f = Cost of an undetected failure.

$F(Ti)$ = Expected number of failures in interval Ti.

c. Depending upon the equation defining the failure distribution, this equation can be solved by differentiation or by iteration (substituting different values for Ti and calculating the resultant expected cost).

d. After the minimum cost inspection interval has been established, the effects on system downtime should be reviewed to assure an acceptable readiness rate is achieved.

4. In establishing inspection intervals, one must consider the desirability of arranging several inspections to occur at the same interval. A minimization of the summation of the individual cost is then sought. The minimization formula previously presented can be used in summation to establish this group inspection interval. However, if inspection intervals are relatively close to each other, a mean interval may be selected if cost/readiness of individuals items are not materially affected. (Where degradation in readiness or cost is not prohibitive, consideration should also be given to scheduling the mission related inspections to occur simultaneously with safety related inspections.)

(d) On-condition maintenance--detect failures.

1. Safety consideration.

Appendix C--Continued

a. If this RCM option is acceptable, the failure is such that injury does not immediately result with failure, but the chance of injury increases the longer the failure goes undetected.

b. The object is thus to establish an inspection interval where the expected time that a failure would go undetected is within acceptable bounds. If the failure density function is known, it should be used to establish the inspection interval.

c. In cases where the density function is not known or is not amenable to mathematical manipulation, the expected time that failure goes undetected can be approximated by one half of the product of the probability that a failure occurs in the inspection interval.

2. Mission consideration.

a. Where the failure does not cause a safety hazard, but rather causes mission failure, the inspection interval is established in a trade-off process involving the cost of inspection, the cost of an undetected failure, and the readiness requirement of the equipment/system.

b. The process of establishing the inspection interval (T_i) is accomplished through minimization of the following cost equation:

$$C(T_i) = \left[C_i + C_f\,(F)(Ti)\right] / T_i$$

where

$C(T_i)$ = Cost per unit time

C_i = Cost of an inspection

C_f = Cost per unit time of an undetected failure

$F(T_i)$ = Expected period of time that a failure would go undetected in inspection interval T_i

c. Depending upon the equation defining the failure distribution, this equation can be solved by differentiation or by itteration (substituting different values for Ti and calculating the resultant expected cost).

d. After the minimum cost inspection interval has been established, the effects on system downtime should be reviewed to assure an acceptable readiness rate is achieved.

(3) Condition monitoring.

(a) Condition monitoring is the process where the operator/crew detects either experienced or impending failures through routine monitoring of operation and use. The experienced failures are those that are detected by the operator/crew when or after they occur. The impending failures are those detectable either directly, by the operator/crew through the human senses (vibration, heat, noise, etc.), or indirectly, through the incorporation of design features such as built-in test equipment (BITE) and sensors/transducers (warning lights, gauges, etc.), before they occur.

(b) Condition monitoring (CM) is generally the most desirable of the three types of maintenance requirements, as it will result in the least number of maintenance actions. However, the constraints of mission readiness, and/or safety may force the inclusion of an on-condition (OC) or hard time (HT) task in combination with condition monitoring if they provide for sustaining higher levels of reliability and/or safety.

(c) The cost of condition monitoring must be determined for impending and experienced failures so that a comparison to on-condition and hard time can be made.

(d) The cost equation for CM is:

$$C(T_D) = (P_{DB}\, C_{DB} + P_{DA}\, C_{DA} + P_{ND}\, C_{ND})\, N_f + C_{WD}$$

Where $C(T_D)$ = Expected cost of detected and nondetected failures in interval T_D.

C_{DB} = The cost of a failure detected before it occurs.

C_{DA} = The cost of a failure detected after it occurs.

C_{ND} = The cost of a failure not detected during interval T_D.

P_{DB} = The probability of a failure being detected before it occurs during T_D.

P_{DA} = Probability of a failure being detected after it occurs.

P_{ND} = The probability of a failure not being detected during T_D.

N_f = The total number of expected failures during the interval T_D.

C_{WD} = The additional total life cycle cost per end item incurred by incorporating the warning device divided by the number of expected intervals during the life cycle.

(e) The probability that a failure can be detected by condition monitoring, either impending or experienced, will be determined from the FMECA or historical data. This probability is comprised of factors such as the probability of the warning device, if included, detecting a failure and emitting a signal, and the probability of the operator/crew perceiving the signal.

(f) The readiness would be calculated for either case of condition monitoring: without a warning device, and with a warning device. These values and the cost estimates would be traded off with those obtained from on-condition, hard time, or a combination of any of the three, to determine the optimum maintenance requirement.

C-10. Recording the Results of the RCM Logic Process. The results of applying the RCM logic in figure C-2 will be recorded on the BØ6 Card of LSAR Data Sheet B, figure B-3. A BØ6 Card will be completed for each failure mode identified on Card BØ5. Detailed instructions for completion of the BØ6 Card are contained in paragraph B-5c of appendix B.

C-11. Examples of RCM Logic Application. a. This section contains illustrative examples of RCM application and documentation in accordance with the instructions provided in paragraphs C-6 through C-9. These examples are not intended to be exhaustive in nature, but rather only assumed primary failure modes and hypothetical data will be used in the illustration. The results presented in these examples do not necessarily reflect the most cost effective maintenance plan for real items of the same class or commodity. The examples are only intended to reflect the process of RCM logic application and documentation.

b. Example 1 - Missile System, Pressurized Gas System.

(1) The item under analysis is a pressurized gas system that has the function to release pressurized gas at a controlled rate during missile flight to provide cooling for flight control gyro's. Upon initiation of firing sequence a disk is ruptured to release the gas which is under 500 psi at 30ºC ambient.

(2) A failure modes, effects, and criticality analysis has been performed on the item and has provided the following information:

FAILURE MODE	SYMPTOM	EFFECT & CRITICALITY
1. Burst disk	Non-pressurized system	Loss of guidance capability during missile flight due to gyro failure.

Appendix C--Continued

FAILURE MODE	SYMPTOM	EFFECT & CRITICALITY
2. Fill port leak	Non-pressurized system	Loss of guidance capability during missile flight due to gyro failure.
3. Faulty squib	None	Disk not ruptured - loss of guidance capability during missile flight due to gyro failure.

(3) Utilizing the FMECA data available, the RCM logic in figure C-2 is applied with the following results:

(a) Block 1. Is function/component failure critical for safety (1a) and/or mission (1b)? This question would be answered "no" for both considerations for all three failure modes because the failure modes identified do not independently produce a safety hazard or mission abort. It is the gyro failure that causes the safety hazard and mission problem which is a secondary failure mode to the gas system failure. This question would be answered "yes" for failure modes 1 and 2 if the pressurized gas was toxic in the amounts contained in the system, thus causing a safety hazard. For this example blocks 1a and 1b on LSAR Data Sheet B would be left blank because of the "no" answers. (See figure C-5.)

(b) Block 2. Does the failure cause secondary failure(s) which have a direct adverse affect on safety (2a) and/or mission (2b)? This question would be answered "yes" for both considerations for all three failure modes. Gas system failure causes gyro failure (secondary failure) and loss of guidance capability. This loss of guidance capability has a direct adverse affect on the mission capability and could endanger personnel safety. Consequently, blocks 2a and 2b would be coded "Y" for all three failure modes. (See figure C-5.)

(c) Block 3. This block is not addressed because of the "yes" answer to each failure mode in block 2.

(d) Block 4. Can the operator/crew detect an impending failure through routine monitoring during normal operations, in time to prevent safety hazard or mission abort? This question must be answered "no" for all three failure modes because no means has been provided to monitor the system pressure for failure modes 1 and 2 and there is no means to monitor failure mode 3.

(e) Blocks 5-7. These blocks are not addressed because block 4 was answered "no" for all three failure modes.

(f) Block 8. Can impending failure be detected by maintenance test or inspection? This question must be answered "no" for all three failure modes because no means have been provided to measure system pressure for failure modes 1 and 2, and there are no tests possible on failure mode 3.

(g) Block 9. This block is not addressed because of the "no" answer for block 8 for each failure mode.

(h) Block 10. Is there an adverse relationship between age, and/or usage, and reliability? Unknown. No real and applicable data is available to determine if the predicted failure modes are age dependent or whether they are caused by faulty assembly during production. Because there is no data to support this question, it should be answered "no" for each failure mode.

(i) Block 11. This block is not addressed because of the "no" answer to block 10 for each failure mode.

(j) Block 12. Is the failure mode detectable by the operator/crew after it occurs? This question must be answered "no". While the missile is in a ready state, the operator/crew has no indication if any of the three failure modes has occurred. After launch, a loss of the guidance capability could be attributable to many different factors, consequently a failure in this system is not detectable either before or after launch.

(4) (a) Application of the RCM logic to the three identifiable failure modes for the pressurized gas system has led to block 22 for each failure mode. The instructions for block 22 are contained in paragraph C-8b(10). These instructions say that an on-condition task must be included in the maintenance plan to detect failures that have occurred, and a trade-off analyses should be performed to determine the feasibility, cost, and risks of redesign versus accepting the inherent probability of failure and incurring a mission failure and safety hazard.

(b) For the system under analysis, the hidden function characteristics present a real maintenance problem because an on-condition task is required but it is not feasible due to the equipment design. The solution here is to redesign the equipment to provide a test or inspection capability, or to live with the inherent reliability characteristics and risks.

(c) In conducting a trade-off analysis between redesign to provide a means of checking or monitoring the pressure within the system and living with the inherent reliability of the design the following should be considered:

1. Inherent reliability prediction for the system.

2. Confidence in the reliability prediction and capability to verify reliability of the system during test.

3. Cost of redesign.

4. Impact of on-condition task on the operator/crew personnel requirements.

5. Any inherent reliability degradation caused by redesign (addition of a test point to measure system pressure may create another source for gas leakage).

6. Feasibility of redesign to provide testing or monitoring capability of the squib.

(d) In this particular example it will be assumed that the predicted reliability values are high enough to make the inherent risks of failure acceptable. In this case, no scheduled maintenance would be performed on the system unless a redesign is both feasible and inexpensive. The results of this RCM application would be carefully reevaluated based on test results on the inherent reliability of the system. In addition, steps should be taken to insure adequate quality control procedures were employed during missile assembly during production.

(5) The results of the RCM application for this system are documented on LSAR Data Sheet B as shown in figure C-5.

Appendix C--Continued

DATA SHEET B: ITEM RELIABILITY (R) AND MAINTAINABILITY (M) CHARACTERISTICS

Card Number B01: 1 FGC WBS WUC: 01101 | 2 End Item Acronym Code: MISSLI | 3 Service Des Ctl: A | 4 FSCM: 18876 | 5 Alternative Action Code: A | 6 Rev Code: A | 7 Data Sheet Status: N | 8 Dwg Class: ALY | 9 Serial Number Effectivity FROM 1 TO SUB | 10 Date: 770615 (YR MO DA) | 11 Update Code: A

Card Number B02: 1 Item Name: PRESS. GAS SYSTEM | 2 Type Model Series | 3 Conversion Factor: 1.00 | 4 Update Code: A

Card Number B03A/B03B: 1 Mfr Part Number: 3B1756213 | 2 FSCM: 18876 | 3 Drawing Number: 3B1756213 | 4 FSCM: 18876 | 5 Update Code: A

Card Number B04: 1 MAINTAINABILITY CONSIDERATIONS (A Adequate, N Not Adequate) | 2 Maintenance Concept Impact (Y Yes, N No): a. Peculiar Support & Test Equipment N; b. Peculiar Tools N; c. Facilities N | 3 R & M Factors: a. Mean Time Between Failure; b. Mean Time to Repair; c. Mean Time Between Maintenance Action | 4 Update Code: A

FAILURE ANALYSIS

Card Number B05A–B05...

a Failure Mode	b Failure Symptoms	c Failure Effect and Criticality	d % of Fail Rate	e Repair Time	f Task Code	Update Code
BURST DISK	NON-PRESSURIZED SYSTEM	LOSS OF GUIDANCE CAPABILITY DURING MISSLE FLIGHT	30.0	.		A
FILL PORT LEAK	NON-PRESSURIZED SYSTEM	LOSS OF GUID. CAP. DURING FLIGHT	40.0	.		A
FAULTY SQUIB	NONE	DISK NOT RUPTURED - LOSS OF GUID.	30.0	.		A

RELIABILITY CENTERED MAINTENANCE ANALYSIS (APPENDIX C)

Card Number B06A–B06...

1A	1B	2A	2B	3	4	5	6	7	8	9	10	11	12	C/M	O/C	H/T	D/R	FGC/WBS/WUC	Task Code	SLN	Update Code
	Y	Y		N					N		N		N	Y			Y				A
	Y	Y		N					N		N		N	Y			Y				A
	Y	Y		N					N		N		N	Y			Y				A

1 ITEM FUNCTION: RELEASE PRESSURIZED GAS AT A CONTROLLED RATE DURING MISSLE FLIGHT TO PROVIDE COOLING FOR FLIGHT CONTROL GYRO'S. UPON INITIATION OF FIRING SEQUENCE A DISK IS RUPTURED TO RELEASE THE GAS WHICH IS UNDER 500 PSI AT 30°C AMBIENT. (Update Code: A)

1 QUALITATIVE MAINTAINABILITY REQUIREMENTS: NONE (Update Code: A)

1 MAINTENANCE CONCEPT: WOODEN ROUND - NO MISSLE MAINTENANCE (Update Code: A)

1 DESIGN RECOMMENDATION/JUSTIFICATION: PREDICTED RELIABILITY PARAMETERS SUPPORT THE WOODEN ROUND CONCEPT. DESIGN REVIEW SHOULD ADDRESS FEASIBILITY OF PRESSURE MONITORING POINT IN THE EVENT THAT PREDICTED RELIABILITY IS NOT ACHIEVED DURING TEST. (Update Code: A)

Figure C-5: Example 1

Appendix C--Continued

c. Example 2 - Helicopter System, Main Transmission (XMSN).

(1) The item under analysis is the main transmission in a helicopter system that has the function of transmitting engine power to the main rotor, tail rotor, and various accessory drives.

(2) A failure modes, effects, and criticality analysis has been performed on the XMSN and has provided the following information:

FAILURE MODE	SYMPTOM	EFFECT & CRITICALITY
1. Leakage (oil jet/ XMSN case)	Low oil pressure High oil temperature	Possible seizure
2. Leakage at oil filter.	Low oil pressure High oil temperature	Possible seizure
3. XMSN input quill leaks.	Low oil pressure High oil temperature	Possible seizure
4. Main XMSN corroded	None	Breakdown in metal
5. Main XMSN manifold worn/chafed.	Low oil pressure High oil temperature	Oil contamination
6. XMSN oil filter element failed.	None	Degraded performance
7. Metal particles on chip detector (oil contaminated)	High metal content in oil samples	Possible internal failure.
8. Main XMSN worn/ chafed.	Possible noise	Completely inoperative
9. Main XMSN leaks at T/R output quill.	Low oil pressure High oil temperature	Possible seizure

(3) The reliability predictions for the main transmission were based on scheduled oil and oil filter changes. This hard time task must be included in the maintenance plan for the XMSN. In addition, oil temperature, oil pressure, and chip detector monitoring gauges are provided in the design to monitor critical XMSN parameters.

(4) Using the above information, the RCM logic in figure C-2 is applied and the results are provided on the LSAR Data Sheet B shown in figure C-6. Discussion for each failure mode is as follows:

(a) Failure mode 1.

1. This failure mode is critical because it causes secondary failures (transmission seizure, main and tail rotor failure) which are critical in terms of both mission and safety. Impending failures can be detected by the operator/crew (block 4) by routinely checking the XMSN oil temperature and pressure gauges, and by maintenance test and inspection (block 5) through visual checks for leakage and through checking the XMSN oil level. Experience on similar transmissions shows an increasing failure rate with XMSN age and usage (block 6).

2. The RCM analysis shows that all three types of maintenance are feasible. In this case, the condition monitoring of oil temperature and pressure through use of the built-in gauges provides the required safety levels and is the least expensive alternative. Consequently, no on-condition or hard time task is justifiable for this failure mode.

(b) Failure mode 2. This failure mode exhibits the same symptoms and effects as failure mode 1 and the RCM results are the same. Condition monitoring of XMSN oil temperature and pressure will satisfy the safety and mission requirements at the least cost.

(c) Failure mode 3. This failure mode exhibits the same symptoms and effects as failure modes 1 and 2, therefore condition monitoring is the RCM result.

(d) Failure mode 4. This failure mode is critical due to possible secondary loss of mobility. This mode is not detectable by the operator/crew before it occurs (block 4), but is detectable through an oil analysis program (block 8). There is no supportive evidence that the mode exhibits an increasing failure rate with age (block 9). A scheduled oil analysis program will detect impending failures with sufficient probability to satisfy mission and safety requirements, consequently this will be included in the maintenance plan.

(e) Failure mode 5. This failure mode is critical because it causes loss of power to the main and tail rotor blades. Blade failures in turn affect mobility which has a direct effect on mission and personnel safety. Impending failures can be detected by the operator (block 4) by monitoring oil temperature, oil pressure, and chip detector. In addition, impending failures can be detected by maintenance test and inspection (block 5) and the mode exhibits an increasing failure rate with age and usage (block 6). Because the condition monitoring mode satisfies both mission and safety requirements, inclusion of any on-condition or hard time task is not justifiable.

(f) Failure mode 6. Due to the conditions provided in paragraph C-11c(3), a hard time replacement of the oil filter is included in the maintenance plan for the XMSN prior to application of the RCM logic. Because of this fact and the inherent reliability of the oil filter element, other maintenance alternatives are not warranted.

(g) Failure mode 7. This failure mode can be condition monitored by the operator/crew (block 4) because of the chip detector and by maintenance test (block 5) by an oil analysis program. Additionally, this mode exhibits an increasing failure rate with age and usage (block 6). Condition monitoring through use of the chip detector is included in the maintenance plan along with the on-condition task of taking oil samples periodically for analysis. The on-condition task is included because condition monitoring alone does not provide adequate mission and safety levels. Scheduled oil samples provide a high probability of impending failure detection due to the relatively long time period between detectable onset and actual failure.

(h) Failure mode 8. This failure mode is critical because it renders the transmission completely inoperative. Condition monitoring is feasible (block 4) because of detectable onset of noise in the transmission. On-condition maintenance (block 5) is feasible through an oil analysis program, and the mode has an increasing failure rate with age and usage (block 6). Condition monitoring coupled with the oil analysis program provides required safety and mission levels, consequently a hard time replacement is not justified. Replacement of the XMSN for this failure mode will be based on the oil analysis program.

(i) Failure mode 9. The symptoms and effects of this failure mode are the same as for failure modes 1, 2, and 3 and the RCM results are the same. Condition monitoring of oil temperature and pressure will satisfy mission and safety requirements.

(5) The results of the RCM analysis dictate condition monitoring for failure modes 1-3, 5, and 7-9, on-condition (oil analysis program) for failure modes 4, 7, and 8, and a hard time replacement of the oil and oil filter. The analysis must now address itself to determining the optimum interval for taking the oil analysis samples. This can be done by using the guidelines presented in paragraph C-9b(2)(c).

(6) For safety considerations, an inspection interval must be established which gives an acceptably low probability of failure during the time period when an impending failure would go undetected. This time period is the time from the end of the last inspection to the time of the next inspection minus the time from detectable failure onset to failure. This may be written as follows:

Appendix C--Continued

$$NT_I - Tos - (N-1)\ T_I$$

Where T_I = time between inspections

Tos = time from failure onset to failure

N = a positive integer

(7) The probability of a failure occurring this time interval is represented by the following expression:

$$P_{NT_I} = \int_{(N-1)T_I}^{NT_I - Tos} f_{NT_I}(t)\ dt$$

Where $f_{NT_I}(t)$ is the failure distribution for the component during the interval $(N-1)\ T_I$ to NT_I.

(8) If the failure distribution of the component is f(t), then the failure distribution from $(N-1)\ T_I$ to NT_I given that the component was operating at $(N-1)\ T_I$ is represented by the following:

$$f_{NT_I}(t) = \frac{f(t)}{\int_{(N-1)\ T_I}^{\infty} f(t)\ dt}$$

(9) Using these expressions, the probability of a failure occurring and not being detected during the time between any two inspections can be expressed as follows:

$$P_{NT_I} = \frac{1}{\int_{(N-1)T_I}^{\infty} f(t)dt} \cdot \int_{(N-1)T_I}^{NT_I - Tos} f(t)\ dt$$

(10) For this example assume that the three failure modes under analysis can be approximated by a normal distribution with a mean of 5000 hours and a standard deviation of 1000 hours. It will be assumed that the service life of the equipment is 10 years, the annual operating requirement is 840 hours, and Tos is 20 hours. Using this information, the probability of a failure occurring and not being detected during

the time between any two inspection points (P_{NT_I}) during the service life of the equipment can be calculated for any inspection interval T_I. For this example, these probabilities were calculated for inspection intervals of 25, 50, and 100 hours for various points in the service life. The results are displayed in tables C-1 through C-3.

(11) Tables such as the ones shown could be calculated for any values of T_I for a complete analysis. Once the tables are constructed then the value of T_I which yields the required safety levels can be selected. For this example it will be assumed that the average and maximum probabilities of the 50 hour inspection interval satisfy the required safety levels.

(12) To complete the analysis, the effects of the 50 hour inspection interval on readiness and cost must be determined. A cost equation should be constructed as shown in paragraph C-9b(2)(c) 3 and minimized with respect to T_I. If the resulting value of T_I is less than 50 hours then the interval would be set at that value because it would satisfy the safety requirements for the least cost. If the value of T_I obtained by minimizing the cost equation was greater than 50 hours, then the inspection interval must be left as 50 hours to satisfy the safety requirements.

(13) The results of the RCM application for this system are documented on the LSAR Data Sheet B shown in figure C-6.

Appendix C--Continued

Table C-1: Probability of going to failure without detecting during specific intervals for T_I = 25 hours.

INTERVAL	P_{NTI}
2500-2525 hours	.000089
5000-5025 hours	.0040
7500-7525 hours	.0139
8375-8400 hours	.0182

Average = .003636

Table C-2: Probability of going to failure without detection during specific intervals for T_I = 50 hours.

INTERVAL	P_{NTI}
2500-2550	.00055
5000-5050	.0478
7500-7550	.0816
8350-8400	.1032

Average = .0247

Table C-3: Probability of going to failure without detection during specific intervals for T_I = 100 hours.

INTERVAL	P_{NTI}
2500-2600	.0016
5000-5100	.0638
7500-7600	.2045
8300-8400	.2503

Average = .0575

DATA SHEET B: ITEM RELIABILITY (R) AND MAINTAINABILITY (M) CHARACTERISTICS

Page 001

Card Number 1-4: B 0 1

1. FGC/WBS/WUC (5-15): 1 4 4 0 3
2. End Item Acronym Code (16-21): SYS-1
3. Service Des Cd (22): A
4. FSCM (23-27): 3 3 2 5 1
5. Alternative Action Code (28): A
6. Rev Code (29): A
7. Data Sheet Status (30): W
8. Dwg Class (31-33): A I Y
9. Serial Number Effectivity FROM (34-53): 1 TO SUB
10. Date (54-59): 7 7 0 6 1 6 (YR MO DA)
11. Update Code (80): A

Card Number 1-4: B 0 2

1. Item Name (16-34): MAIN TRANSMISSION
2. Type, Model, Series (35-60):
3. Conversion Factor (61-64): 1.00
4. Update Code (80): A

Card Number 1-4: B 0 3 A

1. Mfr Part Number (16-31): 1 5 4 7 2 1 - 3
LRNC (32):
2. FSCM (33-37): 3 3 2 5 1
3. Drawing Number (38-53): 1 5 4 7 2 1 - 3
LRNC (54):
4. FSCM (55-59): 3 3 2 5 1

Card Number 1-4: B 0 3 B

5. Update Code (80): A

Card Number 1-4: B 0 4

1. MAINTAINABILITY CONSIDERATIONS (A Adequate, N Not Adequate)

a. Standardization (16)	A	e. Test Points (20)	A	i. Standard Packaging & Transportation (24)	A
b. Accessibility (17)	A	f. Skills (21)	A	j. Fault Location (25)	A
c. Ease of Maintenance (18)	A	g. Training (22)	A	k. Labeling & Identification (Effect Wires, etc.) (26)	A
d. Safety (19)	A	h. Connectors for Ease of Removal (23)	A	l. Design for Self Protection Against Damage After Failure (27)	A

2. Maintenance Concept Impact (Y Yes, N No)

a. Peculiar Support & Test Equipment (28)	Y
b. Peculiar Tools (29)	Y
c. Facilities (30)	N

3. R & M Factors

a. Mean Time Between Failure (31-36)	3 3 1.4
b. Mean Time to Repair (37-42)	1.5 1
c. Mean Time Between Maintenance Action (43-48)	2 0.4

4. Update Code (80): A

FAILURE ANALYSIS

Card Number 1-4: B 0 5 A

a. Failure Mode (16-31)	b. Failure Symptoms (32-47)	c. Failure Effect and Criticality (48-63)	d. % of Fail Rate (64-66)	e. Repair Time (67-71)	f. Task Code (72-78)	2. Update Code (80)
LEAKAGE(OIL JET)	LOW TEMP & PRESS	POSSIBLE SEIZURE	2 0.0	1 5.0	JEFXXAA	A
LEAK AT OIL FILT	LOW TEMP & PRESS	POSSIBLE SEIZURE	1 0.0	1 0.0	JEOXXAA	A
INPUT QUILL LEAK	LOW TEMP & PRESS	POSSIBLE SEIZURE	4.0	2 0.0	JEFXXAB	A
XMSN CORRODED	NONE	METAL BREAKDOWN	2.0	2 0.0	JEDXXYA	A
MANIFOLD WORN	LOW TEMP & PRESS	OIL CONTAMINATED	3 0.0	5.0	JEDXXYA	A

Card Number 1-4: B 0 5 1

RELIABILITY CENTERED MAINTENANCE ANALYSIS (APPENDIX C)

Card Number 1-4: B 0 6 A

a. Logic Results (Figure C-2) Block Number (16-29)	b. Disposition (30-33) CM	OC	HT	DR	c. Task Analysis Documentation FGC/WBS/WUC (34-44)	Task Code (45-51)	SLN (52-53)	2. Update Code (80)
1A 1B 2A 2B 3 4 5 6 7 8 9 10 11 12	Y			N				A
Y Y Y Y Y Y Y Y	Y			N				A
Y Y Y Y Y Y Y Y	Y			N				A
Y Y Y Y Y Y Y Y	Y			N				A
Y Y N Y Y N	Y			N	1 4 4 0 3	B B O X X A A		A
Y Y Y Y Y Y Y Y	Y			N				A

Card Number 1-4: B 0 6

Card Number 1-4: B 0 7

1. ITEM FUNCTION (16-79)
TRANSMITS ENGINE POWER TO MAIN ROTOR AND ACCESSORY DRIVES

2. Update Code (80): A

Card Number 1-4: B 0 8

1. QUALITATIVE MAINTAINABILITY REQUIREMENTS (Fail Safe, Environmental, etc.) (16-79)
NONE

2. Update Code (80): A

Card Number 1-4: B 0 9

1. MAINTENANCE CONCEPT (16-79)
SCHEDULED OIL ANALYSIS SAMPLES AND FILTER REPLACEMENTS. R/R AT ORGANIZATIONAL LEVEL. SEAL REPLACEMENTS AT INTERMEDIATE.

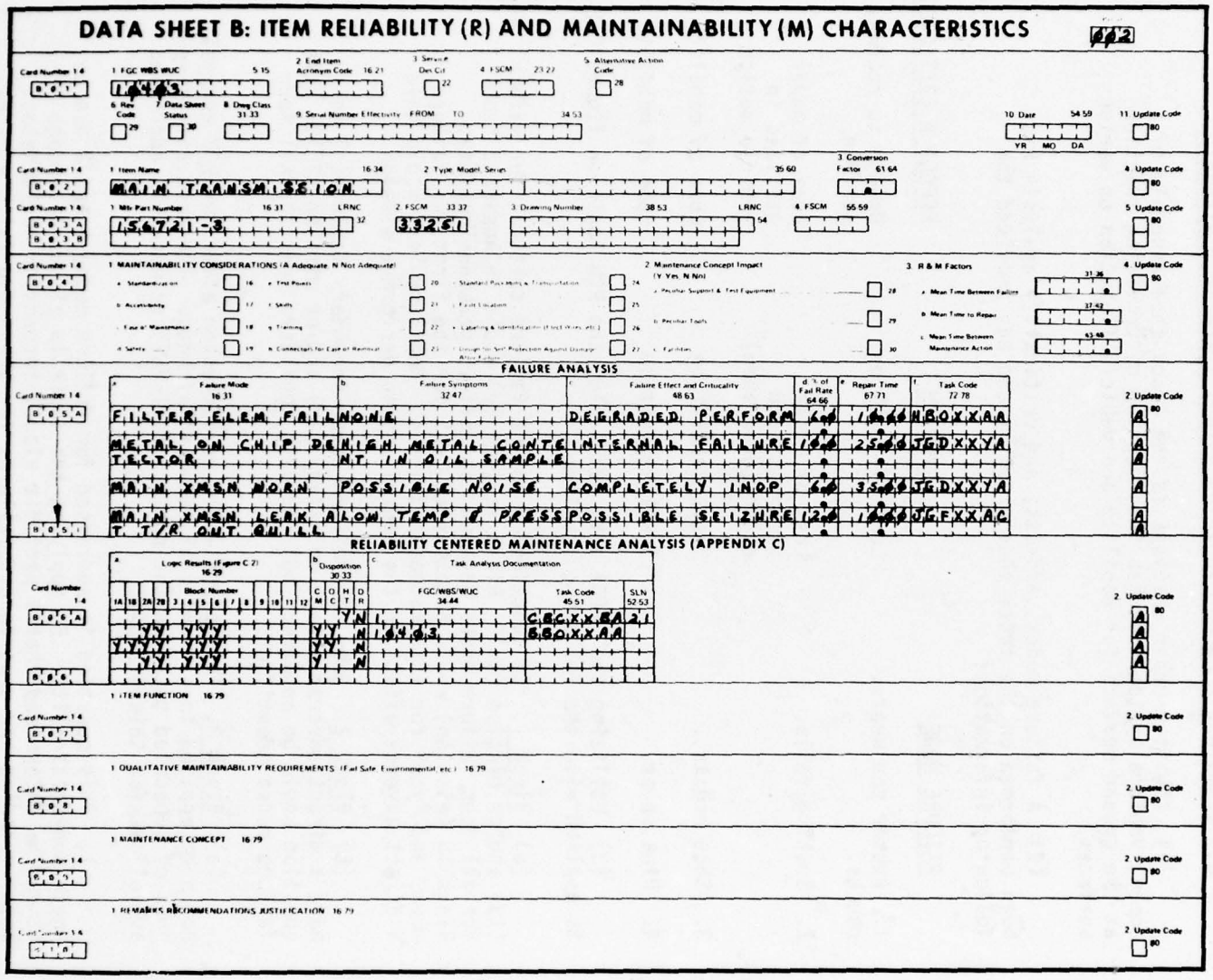
2. Update Code (80): A

Card Number 1-4: B 1 0

1. REMARKS/RECOMMENDATIONS/JUSTIFICATION (16-79)
TRANSMISSION LOAD STAND REQUIRED AT DEPOT

2. Update Code (80): A

Figure C-6: Example 2



DATA SHEET B: ITEM RELIABILITY (R) AND MAINTAINABILITY (M) CHARACTERISTICS

1 FGC WBS WUC: 1443

2 End Item Acronym Code: 3 Service Dev Cit: 4 FSCM: 5 Alternative Action Code: 6 Rev Code: 7 Data Sheet Status: 8 Dwg Class: 9 Serial Number Effectivity FROM TO: 10 Date YR MO DA: 11 Update Code

1 Item Name: MAIN TRANSMISSION

2 Type Model Series: 3 Conversion Factor: 4 Update Code

1 Mfr Part Number: 15672I-3 LRNC: 2 FSCM: 33261 3 Drawing Number: LRNC: 4 FSCM: 5 Update Code

1 MAINTAINABILITY CONSIDERATIONS (A Adequate, N Not Adequate)

a Standardization
b Accessibility
c Ease of Maintenance
d Safety
e Test Points
f Skills
g Training
h Connectors for Ease of Removal
i Standard Part Mtrls & Transportation
j Fault Location
k Labeling & Identification (Test Wires, etc.)
l Design for Self Protection Against Damage After Failure

2 Maintenance Concept Impact (Y Yes, N No)
a Peculiar Support & Test Equipment
b Peculiar Tools
c Facilities

3 R & M Factors
a Mean Time Between Failure
b Mean Time to Repair
c Mean Time Between Maintenance Action

4 Update Code

FAILURE ANALYSIS

a Failure Mode	b Failure Symptoms	c Failure Effect and Criticality	d % of Fail Rate	e Repair Time	f Task Code	2 Update Code
FILTER ELEM FAILNONE		DEGRADED PERFORM	6.00	1.50	HBOXXAA	A
METAL ON CHIP DEHIGH METAL CONTE	INTERNAL FAILURE		1.00	2.50	JGDXXYA	A
TECTOR	NT IN OIL SAMPLE					A
MAIN XMSN NORN	POSSIBLE NOISE	COMPLETELY INOP	6.00	3.50	JGDXXYA	A
MAIN XMSN LEAK ALOW TEMP & PRESS T T/R QNT QUILL	POSSIBLE SEIZURE		1.20	1.50	JGFXXAC	A

RELIABILITY CENTERED MAINTENANCE ANALYSIS (APPENDIX C)

a Logic Results (Figure C-2) Block Number 1A 1B 2A 2B 3 4 5 6 7 8 9 10 11 12	b Disposition CM	OC	HT	DR	c Task Analysis Documentation FGC/WBS/WUC	Task Code	SLN	2 Update Code
			Y	N				A
Y Y Y Y Y Y Y Y Y Y Y Y	Y	Y		N	1443	CBCXXBA	2.1	A
Y Y Y Y Y Y Y Y Y Y Y Y	Y	Y		N	1443	BBOXXAA		A
Y Y Y Y Y Y Y Y Y Y Y Y	Y	I		N				A

1 ITEM FUNCTION

1 QUALITATIVE MAINTAINABILITY REQUIREMENTS (Fail Safe, Environmental, etc.)

1 MAINTENANCE CONCEPT

1 REMARKS RECOMMENDATIONS JUSTIFICATION

Figure C-6: Example 2

Appendix C--Continued

d. Example 3 - Combat Vehicle System, Track Shoe Assembly.

(1) The item under analysis is the track shoe assembly of a combat vehicle system that has the function of providing traction at the ground surface for mobility and vehicle flotation on various surfaces.

(2) A failure modes, effects, and criticality analysis has been performed on the track shoe assembly and has provided the following information:

FAILURE MODE	SYMPTOM	EFFECT & CRITICALITY
1. Rubber pad wears, chunks.	Loss of traction	Damage to roadway surface
2. Bushing fails.	Loss of track alignment and pitch (dead shoe)	Loss of power utilized in vehicle motion
3. Shoe breaks.	Track separation	Loss of mobility
4. Pins shear.	Track separation	Loss of mobility

(3) Utilizing the FMECA data available, the RCM logic in figure C-2 is applied with the following results:

(a) Block 1. Is function/component failure critical for safety (1a) and/or mission (1b)? Block 1a (safety) would be answered "no" for all four failure modes because none affect personnel safety. Block 1b (mission) would be answered "no" for the first two failure modes and "yes" for failure modes 3 and 4. Mobility loss would have a direct adverse effect on the capability to perform a mission.

(b) Block 2. Does the failure cause secondary failure(s) which have a direct adverse effect on safety (2a) and/or mission (2b)? This question would be answered "no" for both considerations for all four failure modes identified.

(c) Block 3. This block would be addressed after the RCM analysis had been applied to all critical components/modes. The cost effectiveness of scheduled tasks on the non-critical failure modes is addressed as follows for this example:

1. This question is addressed for failure modes 1 and 2 due to their non-criticality. By applying the logic in blocks 4 through 12 it can be determined that a periodic visual inspection could detect both impending and experienced failures for these two failure modes. Since a scheduled inspection is feasible, an economic analysis is required to determine if the inspection will reduce the life cycle cost of ownership.

Appendix C--Continued

2. The first consideration is what interval is possible for the scheduled inspection. For the purposes of this example it will be assumed that the design of the end item dictates that the armor skirt must be removed to replace a track shoe assembly and in addition it is determined that an inspection of an adjacent assembly is required every 250 miles which requires removal of the armor skirt. Because both failure modes are non-critical, the only feasible inspection intervals are 250 miles or multiples of 250 miles to coincide with the critical inspection requirement. (Any other interval would dictate removal of the armor skirt solely for inspection of the track shoe assembly thus increasing LCC.)

3. The LCC costs for each alternative will be divided into two parts. The first part will represent the cost associated with removing/replacing the armor skirt and the second part will represent the costs associated with repairing failure modes 1 and 2. With this separation, the LCC for alternative 1 (no scheduled inspection) can be expressed as the following

$$C_{A1} = N (C_1 + C_2)$$

Where N = No of expected failures during useful life of the equipment

C_1 = Cost of R/R armor skirt

C_2 = Cost of repair of failure modes 1 and 2

Under the second alternative the LCC can be expressed as the following

$$C_{A2} = PN(C_2) + (1-P) N (C_1 + C_2) + N_I C_3$$

Where: N_1 C_1, and C_2 are the same as above

P = Probability of detecting an impending failure during inspection

C_3 = Cost of inspecting the track shoe assemblies during each inspection

N_I = Number of expected inspections over the useful life of the equipment

This equation can be rewritten as follows:

$$C_{A2} = N(C_1 + C_2) - NPC_1 + N_I C_3$$

Comparing the two expressions it can be seen that if the expression NPC_1 is greater in value than $N_I C_3$ then C_{A2} will be less than C_{A1} and an inspection should be included in the maintenance plan. If the expression NPC_1 is less than $N_I C_3$ then C_{A2} will be greater than C_{A1} and the inspection would only increase the LCC. If NPC_1 is greater than

N_IC_3 after substitution of the values, then block 3 would be coded "Y" for failure modes 1 and 2. If NPC_1 is less than N_IC_3, then block 3 would be coded "N" for failure modes 1 and 2. For this example it is assumed that NPC_1 is greater than N_IC_3 and block 3 is coded "Y" for failure modes 1 and 2 on the LSAR Data Sheet B shown in figure C-7 and the scheduled inspection is included in the maintenance plan.

(d) Block 4. Can the operator/crew detect an impending failure through routine monitoring during normal operations, in time to prevent safety hazard or mission abort? This block is addressed for the two critical failure modes (3 and 4). In both cases the answer would be "no".

(e) Blocks 5-7. These blocks are not addressed due to the "no" answer for block 4.

(f) Block 8. Can impending failure be detected by maintenance test or inspection? This must be answered "no" for both critical failure modes.

(g) Block 9. This block is not addressed due to the "no" answer in block 8.

(h) Block 10. Is there an adverse relationship between age, and/or usage, and reliability? This question must be answered "no" for both failure modes because there is no economic means to monitor individual track shoe assembly age or usage, consequently a hard time limit on individual assemblies is not feasible. This question could be answered "yes" when applying the logic to the entire track.

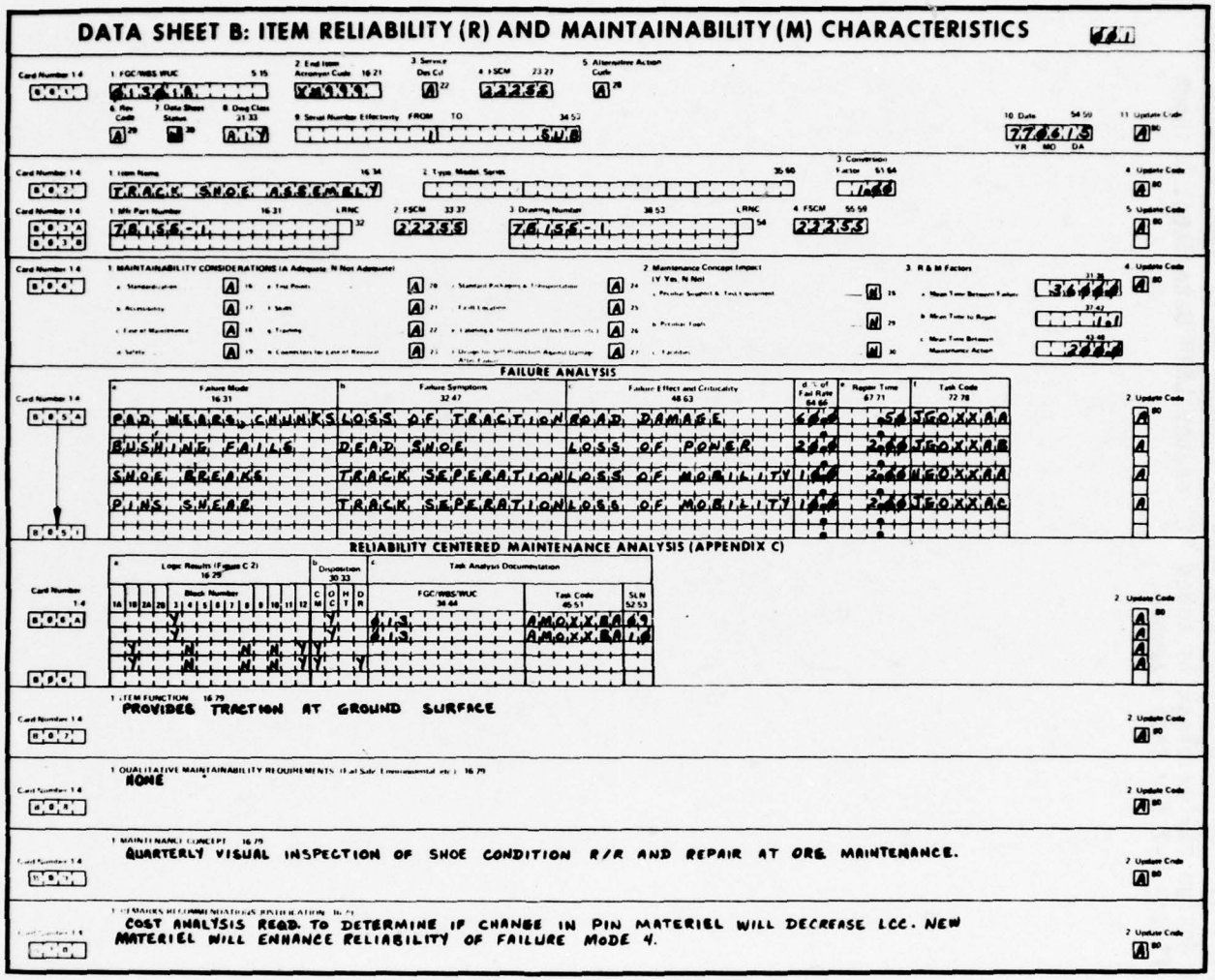
(i) Block 11. This block is not addressed due to the "no" answer in block 10.

(j) Block 12. Is failure detectable by operator/crew when or after it occurs? The answer to this question is "yes" for both failure modes 3 and 4. Track separation would be noticed immediately by the operator/crew.

(4) Application of the RCM logic dictates that preventative type maintenance is not feasible for failure modes 3 and 4 of the track shoe assembly. Since these two failure modes are critical only from a mission standpoint, it must be determined whether the predicted reliability is acceptable or whether a redesign is required. In this case a feasible redesign is using a different pin materiel in the track shoe assembly which will provide a higher reliability for failure mode 4. Using the new pin materiel will increase the assembly's reliability and procurement cost and will affect the projected life cycle support cost. A trade-off

Appendix C--Continued

analysis would be required if the increased procurement cost is not offset by a corresponding reduction in support cost. Consequently, the design review block is coded "Y" on the LSAR Data Sheet B shown in figure C-7 for this example.



DATA SHEET B: ITEM RELIABILITY (R) AND MAINTAINABILITY (M) CHARACTERISTICS

1 FGC/WBS/MUC: 1 1 3 1 1 A
2 End Item Acronym Code: Y M 1 1 1
3 Service Use Ctl: A
4 FSCM: 2 2 2 5 5
5 Alternative Action Code: A
6 Rev Code: A
7 Data Sheet Status:
8 Dwg Class: A T Y
9 Serial Number Effectivity: FROM ... TO: S N B
10 Date: 7 7 0 6 1 5 (YR MO DA)
11 Update Code: A

1 Item Name: TRACK SHOE ASSEMBLY
2 Type Model Series:
3 Conversion Factor: 1.00
4 Update Code: A

1 Mfr Part Number: 7 8 1 5 5 - 1
LRNC:
2 FSCM: 2 2 2 5 5
3 Drawing Number: 7 8 1 5 5 - 1
LRNC:
4 FSCM: 2 2 2 5 5
5 Update Code: A

1 MAINTAINABILITY CONSIDERATIONS (A Adequate, N Not Adequate)
a. Standardization: A
b. Accessibility: A
c. Ease of Maintenance: A
d. Safety: A
e. Test Points: A
f. Skills: A
g. Training: A
h. Commercial Use Level Removal: A
i. Standard Packages & Transportation: A
j. Facilities: A
k. Labeling & Identification (Check Lists, etc.): A
l. Operation: A
2 Maintenance Concept Impact (Y Yes, N Not)
a. Peculiar Support & Test Equipment: N
b. Peculiar Tools: N
c. Facilities: N
3 R & M Factors
a. Mean Time Between Failure: 3 6 4 4 4
b. Mean Time to Repair: 1 5 1
c. Mean Time Between Maintenance Action: 2 8 4 4
4 Update Code: A

FAILURE ANALYSIS

a. Failure Mode (16-31)	b. Failure Symptoms (32-47)	c. Failure Effect and Criticality (48-63)	d. % of Fail Rate (64-66)	e. Repair Time (67-71)	f. Task Code (72-78)	2 Update Code
PAD WEARS, CHUNKS	LOSS OF TRACTION	ROAD DAMAGE	60	.5	TGOXXAA	A
BUSHING FAILS	DEAD SHOE	LOSS OF POWER	20	2.0	TGOXXAB	A
SHOE BREAKS	TRACK SEPERATION	LOSS OF MOBILITY	10	2.0	TGOXXAA	A
PINS SHEAR	TRACK SEPERATION	LOSS OF MOBILITY	10	2.0	TGOXXAC	A

RELIABILITY CENTERED MAINTENANCE ANALYSIS (APPENDIX C)

a. Logic Results (Figure C-2) Block Number	C M	O C	H T	D R	b. Disposition	c. Task Analysis Documentation: FGC/WBS/MUC	Task Code	SLN	2 Update Code
1 Y		Y				1 1 3	AMOXXBA	0 3	A
2 Y		Y				1 1 3	AMOXXBA	1 0	A
3 Y N	N								A
4 Y N	N								A
5 Y N	N	Y							A

1 ITEM FUNCTION: PROVIDES TRACTION AT GROUND SURFACE

1 QUALITATIVE MAINTAINABILITY REQUIREMENTS (Ref Safety, Environmental, etc.): NONE

1 MAINTENANCE CONCEPT: QUARTERLY VISUAL INSPECTION OF SHOE CONDITION R/R AND REPAIR AT ORG MAINTENANCE.

1 REMARKS/RECOMMENDATIONS/JUSTIFICATION: COST ANALYSIS REQD. TO DETERMINE IF CHANGE IN PIN MATERIEL WILL DECREASE LCC. NEW MATERIEL WILL ENHANCE RELIABILITY OF FAILURE MODE 4.

Figure C-7: Example 3

(DRCRE-IA)

FOR THE COMMANDER:

OFFICIAL:

ROBERT L. MOORE
Brigadier General, USA
Chief of Staff

G. J. HAROLD
LTC, GS
Adjutant General

DISTRIBUTION:
Special